The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia.

Adelaide | Nov., 1924

VOL. VI | No. 1

CONTENTS.

The authors of papers are responsible for the facts recorded and opinions expressed.

Address of the Section: C/o Royal Society's Rooms, Institute Building, North Terrace, Adelaide.

Published Quarterly — Single Copy—NINEPENCE

Obtainable from Cole's Book Arcade, No. 14 Rundle Street, Adelaide.

Felstead & Ormsby, Printers, Bookbinders, Gilbert Place, Adelaide

Field Naturalists' Section of the Royal Society of South Australia.

Office Bearers, 1924-25.

Chairman—Mr. E. S. Hughes.

Vice-Chairman—Prof. T. Harvey Johnston, D.Sc.

Hon. Secretary—Mr. E. H. Ising, Loco. Dept., Railway Station, Adelaide.

Assistant Hon. Secretary and Assistant Treasurer—Miss E. Ireland.

Hon. Treasurer—Mr. B. B. Beck, Cole's Book Arcade, Rundle Street.

Hon. Librarian—Miss I. Roberts.

Hon. Press Correspondent—Mr. D. J. McNamara.

Hon. Magazine Secretary—Miss M. Roeger.

Committee—Dr. C. Fenner, F.G.S., Messrs. Wm. Ham, F.R.E.S., W. H. Selway, W. J. Kimber, W. Champion Hackett, F.R.H.S., C. Pearce, A. J. Morison and J. A. Hogan, Miss Roeger, and the Chairman and Secretary of the Flora and Fauna Committee.

Hon. Auditors—Messrs. W. D. Reed, F.C.P.A., and A. J. Morison.

Fauna and Flora Protection Committee—Captain S. A. White, C.M.B.O.U., Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Prof. F. Wood Jones, D.Sc., Messrs. E. Ashby, F.L.S., M.B.O.U., W. H. Selway, J. M. Black, J. F. Bailey, A. H. Elston, F.E.S., A. M. Lea, F.E.S., F. Angel, W. Champion Hackett, F.R.H.S., B. B. Beck, J. Neil McGilp, A. J. Morison, and J. Sutton, and Mrs. W. Champion Hackett.

"The South Australian Naturalist," Editor—Mr. Wm. Ham, F.R.E.S., The University, Adelaide.

Business Committee—Miss Roeger, Mrs. Day, and Mr. J. Sutton.

FORTHCOMING EXCURSIONS.

1924.

November 15—Cherry Gardens. Orchids, etc. Charabanc, 1.30 p.m. Leader, The Chairman, Mr. E. S. Hughes.

November 29—Morialta. Botany. Tram, 2 p.m. Leader, Mr. J. A. Hogan.

December 13—Outer Harbor. Dredging. Train, 1.35 p.m. Prof. T. Harvey Johnston and Mr. H. M. Hale.

December 20—Visit, by special invitation, to Mrs. Simpson's Garden at Mount Charles, near Woodside. Charabanc, 1.30 p.m. Seats must be booked by 6th December, or trip may be cancelled.

1925.

January 31—Outer Harbor. Dredging. Train, 1.35 p.m. Leaders, Prof. T. Harvey Johnston and Mr. B. B. Beck.

EVENING MEETINGS.

November 18—"Tropical Fruits." Mr. J. F. Bailey. Photographic Exhibits by Messrs. A. Wilkinson, P. H. Williams, and other members.

. . The . .
South Australian Naturalist.

VOL VI. ADELAIDE, NOVEMBER, 1924. No. 1.

ANNUAL MEETING, SEPTEMBER 2, 1924.

The annual meeting of the Field Naturalists' Section of the Royal Society was held on Tuesday evening at the society's rooms, North terrace. The honorary secretary (Mr. E. H. Ising) read the annual report.

THE FORTY-FIRST ANNUAL REPORT, FOR YEAR ENDING 31st AUGUST, 1924.

The work of the year has been well maintained. Ten lectures were given and excursions have been held practically fortnightly throughout the period.

The subjects studied during the various excursions have been: —Astronomy, dredging, physiography, botany, general, shells, birdlife, fossils, and forestry.

Natural History Survey of the National Parks and Reserves. —An attempt has been made this year to make a Natural History Survey of the various parks and reserves, and so far three trips have been made to National Park, Belair, one to Morialta, and one to Waterfall Gully. Lists of the indigenous and naturalised flora are being prepared and these will be brought up-to-date after subsequent visits. Mr. J. Sutton has offered his lists of birds of the National Park, and Dr. Fenner has promised to write on the physiography and geology of the areas under survey. It it intended to print an account in the "S.A. Naturalist" of the work done with lists attached.

Plant Survey and Herbarium.—This sub-committee has had a busy time, several meetings were held, and the Herbarium keepers and others have accomplished much good work in sorting out specimens. Cardboard boxes have been purchased, and Mr. J. F. Bailey has kindly presented a quantity of specimen folders. Specimens have been received from many parts of South Australia from interested friends. Most of these specimens are awaiting classification, and with the Tepper Herbarium there is plenty of work for this committee. The Royal Society granted £15 for this work, and so far about half has been spent on boxes, cards, etc.

Membership.—On 1st October, 1923, the membership was 185, and on 1st September, this year, it is 217. We regretfully record the death recently of Mr. H. Bushell. New members elected during the year total 43, while a number resigned.

Flower Show, 1923.—The net proceeds were £25 15/8. We are greatly indebted to the Right Hon. the Lord Mayor for granting the use of the Town Hall on payment of working expenses. Only for this the show would have been a financial loss.

"S.A. Naturalist."—Our journal has been issued regularly under the able editorship of Mr. Wm. Ham, and Volume V. has now been completed.

J. B. CLELAND, Chairman.
E. H. ISING, Hon. Secretary.

LIBRARIAN'S REPORT.

During the year under review, members have availed themselved to a fair extent of the Library of the Section, but this is now so cramped for room that the books have simply to lie one on top of another, with the result that quite a protracted search is necessary to drag them from their hiding-places. While the addition of volumes relating to Nature Study in all its branches is greatly to be desired, their appropriate housing is a matter of such urgency, that it is difficult to prevent the books from overflowing the meagre cupboard in which they remain merely on sufferance.

I. M. J. ROBERTS.

August, 1924.

Congratulating the society on a successful year, crowned by the opportunity afforded members of participating in the Adelaide meeting of the Australian Association for the Advancement of Science, the retiring chairman (Professor J. B. Cleland), referred to the material increase in membership and the maintenance of a high level of enthusiasm. Their members, drawn from many walks of life, promised to render to the community services of the first importance. Two new departures were specially worthy of mention—the institution of an Herbarium and the systematic botanical and geological survey of our National Park and other reserves near Adelaide. The number of plants collected had assumed formidable proportions. Mr. L. Reese, of the Minnie Downs Station, on the Birdsville track, had forwarded 150 species of plants, with notes as to locality and fodder value. These had been identified by Mr. J. M. Black, and one new species discovered. With regard to the plant survey, Mr. J. A. Hogan had rendered invaluable assistance. Seeds of native flora sent to Mr. J. F. Bailey, and planted in plots at the Botanical Gardens, had germinated well. On the completion of the survey it was purposed to publish a semi-popular account of the animals and plants embraced by the survey. The importance of assiduous collecting was emphasised. Mosses and lichens were pointed out as groups

hitherto neglected, and mention was made of a collection of 100 species of Tasmanian mosses given by Mr. L. Rodway to Mr. W. C. Hackett for the service of local collectors. That destructive but interesting creature, the "gall-maker," was cited as offering a wide field for research, its operations and resulting architecture being illustrative of the general development of cell and tissue in living organisms.

The professor then proceeded to speak on "Commonplace observations on the natural history of our surroundings." He strongly recommended the perusal of Gilbert White's "Natural History of Selborne." Some valuable remarks on flies and mosquitoes followed. The difference between the bush fly and the house fly were lucidly described. The domestic mosquito (*Culex fatigans*) was to be distinguished from the wild mosquito and the anopheline species which is a possible conveyor of malaria. The mosquito afforded an excellent medium for nature study, especially the larvae arrangement of the eggs and where these are laid, the effect of the bite of the female, time of biting, and so on. A fruitful source of observation might be found in the pittosporum hedges so common in the suburbs, and which are often attacked by a destructive scale insect.

Officers for 1924-25 were then elected. (See inside cover page.)

OUR ANNUAL SHOW.

By the kindness of the Lord Mayor, we were again enabled to use the Town Hall. We were pleased that the Lord Mayor (Mr. C. R. J. Glover) was able to attend and declare the Show open. In a very sympathetic speech the Lord Mayor expressed his appreciation of the work done by the Section, and congratulated our President, Mr. E. S. Hughes, as an old member of the City Council, His Excellency the Governor and Lady Bridges visited the Show on Friday, and the Governor-General and Lady Forster made an interested survey of the exhibits on the Saturday morning.

This year the committee were able to make a separate display of the flowers from each of the schools sending in specimens. This entailed much more work on the members of the committee, but the display was thereby rendered much more interesting, and the Herbarium will be enriched by specimens identified as coming from many separate localities.

The general display was exceedingly fine. The effect was greatly heightened by displays of the "Giant Lily of New South Wales (*Doryanthes excelsa*), Waratahs, flannel flowers, and a number of showy Western Australian plants, including the "Smoke Bush," "Kangaroo Paws," pink everlasting, and blue leschenaultias.

Mr. Bellchambers attended and gave lecturettes on the life of the mallee fowl to a succession of delighted audiences. Captain White, too, lectured to crowds, who learned a great deal about the practical value of the wonderful bird life of our State. Mr. Edgar R. Waite showed a collection of stamps bearing figures of animals, but his most interesting exhibit was one of sketches done by himself on a series of envelopes, which had gone through the post to England. Mr. Waite also showed several live lizards, including an albino form of the common "stumpy tail." There were interesting collections of insects by Mr. A. H. Elston, and of shells by Master R. Pulleine, Mr. C. Walton, and Mr. W. J. Kimber. A fine show of the metallic and non-metallic minerals of the State were lent by the courtesy of the Mines Department and a collection was shown by Miss I. Roberts.

Microscopes and slides lent by Dr. R. H. Pulleine and Mr. J. Webb proved of intense interest. Professor J. B. Cleland made a most instructive show of fungi and of eucalyptus fruits. Misses E. Macklin, Davies and Featherstone had a very comprehensive display of seaweeds, lichens and other small plants. Mr. G. Samuel exhibited specimens of plants infected with rust diseases, etc. Paintings done by Miss A. Ashby, representing many of our native flowers, were most beautifully depicted. The poster competition brought in a very interesting set of exhibits. First prize went to Miss Erica Hosking; second prize to Miss Kathleen M. Sauerbier. In paintings, the first prize was awarded to Miss Lois Laughton; second prize to Miss Irene E. Crossing.

The schools sent in a fine lot of exhibits. Mr. Black awarded the prizes as follows:—First prize, Myponga; second, Hermitage; third, Stansbury; fourth, Bordertown; fifth, Lameroo; sixth, Melrose. Murrayville, just across the border in Victoria, also qualified.

In the Banqueting Room there were a number of interesting exhibits of furniture by the Australasian Implement Company, Messrs. Harris, Scarfe & Co., and Messrs. James Marshall. The making of bats from Australian timber was illustrated by exhibits by Mr. E. Kumnick. Dr. A. W. Hill had on view a fine collection of walking sticks made and carved by himself from native woods. The Forestry Department of the University, through the kindness of Mr. H. H. Corbin, made a fine display of native timbers in the rough, and worked into various forms. Mr. A. J. Wiley showed a collection of beautiful articles made from Australian woods.

The General Committee consisted of the Chairman (Mr. E. S. Hughes), Prof. Cleland, Prof. Osborn, Dr. R. S. Rogers, Dr. C. Fenner, Captain White, Messrs. J. F. Bailey, Black, Hackett, Elston, Beck, Burdett, Ham, Edquist, J. Sutton, O. Glastonbury, J. A. Hogan, Elliott, J. Neil McGilp, Misses Roeger.

Officers and Workers.

Those responsible for the arrangement and management of the exhibition were:—

Scientific Classification and Display of Flowers.—Mr. J. M. Black (convener), Professors J. B. Cleland and T. G. B. Osborn, Dr. R. S. Rogers, Messrs. J. F. Bailey, W. Ham, W. Champion Hackett, J. Sutton, J. A. Hogan and J. Neil McGilp, Misses M. Roeger, M. L. Benda, Amy Simpson, D. Featherstone, H. Roberts, Cora Munns, Macklin, and Illingworth, Mesdames Elliott, J. M. Black and T. H. Johnston.

Massed Effect and General Display.—Miss I. Roberts (convener), Messrs. C. Pearce, A. J. Morison, J. Burton, F. Clark, George Beck, W. Rosser, Mesdames B. B. Beck, C. Pearce, M. H. Law, A. Day, and W. Rosser, Misses N. Roberts, A. E. Faehse, F. Watson, Rose Hawkes, and M. Catt.

Exhibits from Other States.—Mr. E. S. Hughes (convener).

Decorated Tables and General Decorations.—Mrs. W. C. Hackett and Miss A. Simpson (conveners), Miss E. Hocking.

Paintings of Wild Flowers.—Mr. W. Champion Hackett (convener), Miss C. A. Benda, Mr. and Mrs. L. H. Howie.

Native Birds.—Capt. S. A. White (convener).

Insects.—Mr. N. B. Tindale (convener), Mr. A. H. Elston.

Native Fishes and Reptiles (Aquarium Society).—Mr. B. B. Beck (convener), Mr. J. W. Goodale.

Shells and Fossils.—Mr. W. J. Kimber (convener), Master R. Pulleine, Messrs. C. Walton, D. Looker and F. Trigg.

Native Gems and Minerals.—Miss I. Roberts (convener) and Dr. Fenner.

Fungi.—Professor J. B. Cleland (convener).

Microscopic Exhibits.—Dr. R. H. Pulleine (convener), and Mr. W. J. Webb.

Seaweeds.—Mrs. T. G. B. Osborn, Misses D. Macklin and Davies.

Mosses and Lichen.—Misses Macklin and Featherstone.

Australian Timbers.—Mr. S. W. Jackman (convener).

Arrangement of Hall.—Messrs. J. F. Bailey and A. J. Morison.

Advertising and Press Reports.—Messrs. E. H. Ising and D. J. McNamara.

Sale of Flowers.—Mrs. C. Pearce (convener), Misses M. and I. Hackett and A. and M. Robjohns.

Schools that sent flowers:—Aldgate, Basket Range, Bordertown, Cherry Gardens, Clarendon, Crafers, Eden, Golden Grove, Greenock, Hermitage, Hindmarsh Tiers, Hindmarsh Valley, Hamilton, Inman Valley, Kangaroo Flat, Lameroo, Myponga, Murrayville (Vic.), Melrose, Mylor, McLaren Flat, Mount Compass, Oodlawirra, Palmer, Quorn, Sedan, Stansbury, Stirling East, Truro, Tweedvale, Uraidla, Victor Harbor, Williamstown and Wood's Point..

Other contributors were:—Mrs. L. E. Page, Myponga; Mr. W. Tilling, Mylor; Miss Ruby Ashenden, Kuitpo Forest; Mr. W. A. Stow, Highbury East; Mr. A. K. Newberry, Mount Lofty; Mr. E. Ashby, Blackwood; Mr. and Mrs. A. B. Routledge, Hindmarsh; Mr. W. J. Hill, Rose Park; Mr. G. Thyer, Beltana.

The following miscellaneous exhibits were sent in:—Book of pressed orchids, Head Teacher, Aldgate; painting, not for competition, Miss M. Robjohns; Mr. E. Ashby, drawer of chitons and collection of humming birds; Miss A. M. Ashby, collection of paintings of native flowers; sponges from Henley Beach, Mr. W. Hill, Kensington Road, Rose Park.

Interstate flowers received:—Queensland.—From Queensland Field Naturalists' Club, two parcels per Mrs. W. M. Mayo, hon. secretary. New South Wales.—From Naturalists' Society of N.S.W., per Misses T. Harris and H. Butler; Mr. D. E. Chalker, Hill Top, Waratah and Boronia; Mr. A. Morris, from Roseville; Miss L. A. Steinbeck. Mangrove Mountain via Gosford, Giant Lilies, etc. Broken Hill.—From Barrier Field Naturalists' Club; Mr. A. Morris, per Mrs. Sayce. Victoria.—From Victorian Field Naturalists' Club, per Mr. C. D'Alton, Hall's Gap, Grampians; Mr. C. Lenz, Moe, Boronia. Western Australia.—Royal Society of W.A., per Mr. W. M. Carne, Government Botanist; Naturalists' Club of W.A., per Mr. H. Steedman, Perth; Mr. R. S. Stubbs, per Mr. W. D. Robinson, Perth; Mrs. M. K. Rogers, Wongan Hills; Mrs. W. Roeger, East Perth.

Photographs of forest scenes were donated by the following:—Queensland Railway Department; Forests Commission of Victoria; Forestry Commission of New South Wales; Forests Department, Perth, West Australia.

Samples of timbers were kindly given by: — Queensland Forestry Department; Forests Commission of Victoria; Forestry Commission of New South Wales, and the Forests Department, Perth, W.A.

NOTES ON THE LIFE-HISTORY OF THE MOTH,

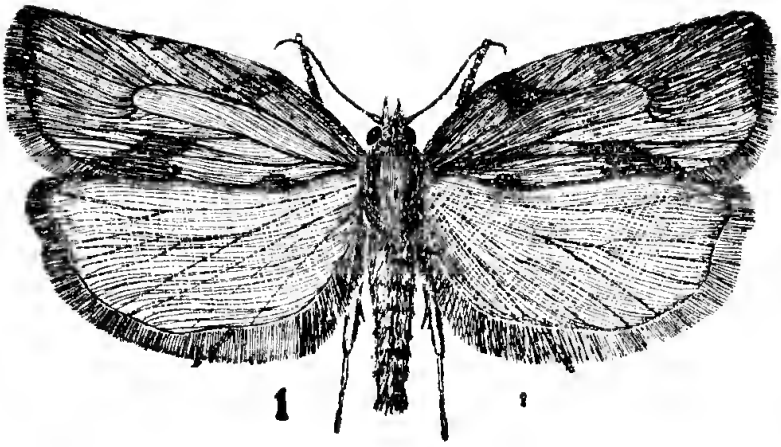
CACOECIA POSTVITTANA, Walk. *(Tortricidae.)*

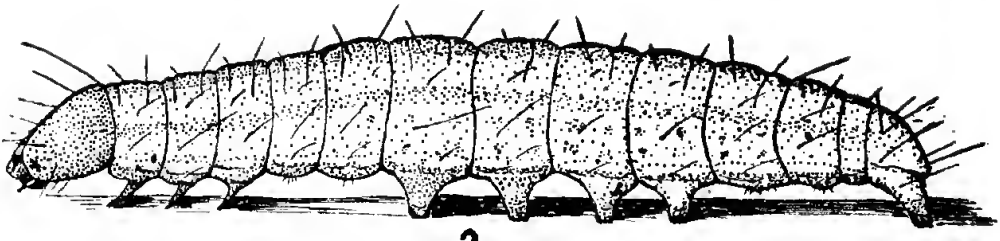
By NORMAN B. TINDALE, South Australian Museum.

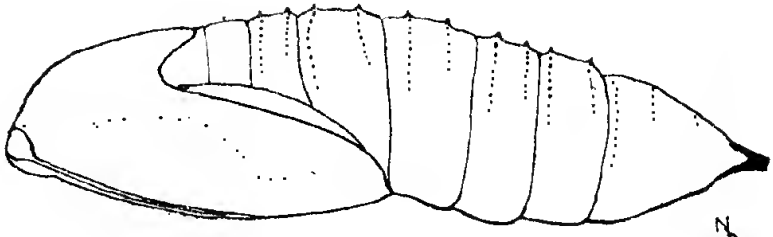
Last August Mr. L. Everett, of Waikerie, on the River Murray, sent down an orange with a green caterpillar burrowing in the pithy layer under the skin. It pupated on the 14th, and emerged on September 7th. The adult proved to be a female specimen of the common moth, *Cacoecia postvittana,* sometimes known as the "Light-brown Apple Moth." A few observations on the life-history are made in the following lines.

C. postvittana is a native insect which has become in recent years a pest of the apple and the pear. It is less commonly found on the orange, in rose buds, and in various other cultivated flowers and fruits. It should not be confused with the codlin moth. In its native state, it has been recorded on various plants, for example on the flowers, fruits, or leaves of Boronia, Persoonia, Grevillea, and a swamp-growing species of Polygonum. Being an insect of varied tastes, it has had no difficulty in transferring its attentions to the introduced plants. Sometimes it is an internal feeder, burrowing into the heart of a fruit, at other times it gathers a few leaves together in a web, and feeds therein. When it burrows into a fruit it usually lines the cavity made with silk. The caterpillar when adult is about 17 mm. ($\frac{5}{8}$th of an inch) in length, and about 3 mm. wide at the middle, being more slender in front and behind. The head is yellowish-green in colour and the body pale green, with a wide median and narrower lateral longitudinal stripes of a darker green running the full length of the body. It is everywhere sparsely covered with slender hairs.

When feeding on the orange, the larva confines itself to the white pithy portions and the skin, making several more or less open excavations which are then partially covered over with a silken covering (see inset figure).







Cacoecia postvittana Walk.

1. Imago (x4). 2. Adult-larva (x6). 3. Pupa (x8).

Orange attacked by *C. postvittana*.

Beneath this slight web it remains concealed during the day (it is a nocturnal feeder), but on being disturbed it becomes very active, making jerky movements of escape. It may let itself fall, remaining suspended by means of a silk thread. The fruit attacked soon becomes mouldy and soft, as in the example figured. When fully fed the larva spins a loose cocoon, gathering together pieces of debris or leaves, and within this changes to a pupa about 10.5 mm. in length, pale green in color, with the abdominal segments somewhat yellowish. On the dorsal surface of each abdominal segment there are two transverse rows of fine spines, the anterior row on each segment extending further around the body than the posterior. The tips of the spines are dull reddish-brown in color.

The moth is about 20mm. in expanse (3-4ths. of an inch), and the forewings are pale brown with darker markings. The hindwings are light-grey in color, with, sometimes, a number of indistinct darker marks giving the wings a mottled appearance. The head and antennae are light brown, while the body is creamy-grey and the legs dark grey with light-brown tips to each tarsal joint. The species is extremely variable in color and markings. It flies in September, December, January and March, and can be found commonly in open places and in the vicinity of orchards.

LECTURE, "THE STURT PEA," BY DR. OWEN M. MOULDEN, AUGUST 5, 1924.—As this flower is the chosen emblem of the Field Naturalists' Section it was particularly fitting that it should be made the subject of an evening lecture. All those plants which have their fruit in pods belong to the order *Leguminosae,* and it is to this great order of podbearing plants that the Sturt pea belongs. And in this order three sub-orders are distinguished—*mimosoideae* (acacias and wattles), *caesalpinoidea* (of which the cassias are members), and *papilionnatae* (so called from the resemblance of the flowers to a butterfly). The Sturt pea, the Darling pea, our *Hardenbergia* (or native lilac) belong to this sub-order. The sub-order of *papilionanatae* contains several genera, and the Sturt pea is found in the gnus *Clianthus* (from two Greek words, meaning "glory flower"). The New Zealand glory pea is another species of *clianthus*, Sturt pea being known as *C. speciosus.* The Sturt pea is a perennial for perhaps four years under careful cultivation. It has stout, procumbent, upright stems, generally a central upright stem, with a number of lateral trailing stems, each of these sending out smaller laterals, until the plant may form a bush as much as 12 feet in diameter. The flowers are large, from three to four inches long, and consist of the "standard," two alae or wings, and the carina, or boat, not unlike other peas. The standard is usually two to three inches long, of bright scarlet, with a large purplish or brownish purple blotch. The pod is long, narrow, and coriaceous, or leathery. During 1921 there appeared in the West Darling district a remarkable display of Sturt peas, many times more numerous than had ever before been observed. One would come across acre after acre of these great brilliant red patches on the beautiful soft olive-green background of the foliage. This wealth of bloom was no doubt the result of copious summer rains followed by warm, bright weather in the late summer and autumn. The root system is very remarkable, a main tap root with smaller subsidiary rootlets branching from it downwards and outwards. The tap root may have a length of from 12 to 20 feet. By this means the plant is enabled to reach the great reserves of underground moisture. Another interesting feature was the display of colour variations, of which at least 30 were observed, ranging from almost pure white, through brown and purple, to the normal scarlet. The lecturer then explained his methods of transplanting and cultivation, and also of raising plants from seed. The mode of fertilizing and propagation were also dealt with, and from careful experiments and observation it was concluded that they were self fertilized, as the stigma was too thickly surrounded with its own pollen grains to permit of the introduction of pollen from another flower.

LECTURE, "PIGMY RACES OF THE WORLD," BY DR. R. H. PULLEINE, SEPTEMBER 16, 1924.—The lecturer described the "Pigmies" as little people with very primitive habits and forming separate communities, being found in many parts of Africa, in the Andaman Islands (in the Bay of Bengal), in the Phillipines, and as far south as New Guinea and the Solomons. They were mentioned in Egyptian records as having been kept at the Courts as curiosities, and were known to the Greeks as legendary people. Then for 2,000 years they were lost sight of, and Gibbon, in 1859, regarded the Pigmies as legendary. Du Chaillu was the first to record Equatorial Pigmies in 1867 in the Gaboon. He was followed by Schweinfurth, who found them in the Ituri forest in 1870. The beautiful belts worn by the "little men" were made from the skin of that remarkable animal, the okapi. The country inhabited by these people was very difficult of access, consisting of an indescribably dense forest, with climbing plants, fallen trees, and animal pests. The Pigmies were a very primitive type, believed to be the survivals of an ancient aboriginal stock which had become isolated among races of a different origin. They could be roughly classed as African Pigmies and Eastern Pigmies. The Equatorial Pigmies were found in the whole watersheds of the Rivers Congo and Semliki. The Bushmen of Lake Ngami were an allied race. The Bushmen were formerly widely distributed. Traces of an aboriginal Negrito-Pigmy race were also found in Madascar. Of the Eastern Pigmies there were found in the Andaman Islands the only isolated Pigmy race, comparable in this respect to the Tasmanians. The Semans occupied the mountains forming the backbone of the Malay Peninsula. They were being gradually absorbed. In the Phillipines the Negrito Pigmies occupied the more inaccessible parts. Wollaston discovered the Tapiro Pigmies in the mountains of Dutch New Guinea. Though of small dimensions (men, 4ft. 7in.; women, 4ft. 2in.), the Pigmies showed no marks of degeneration. They were sturdy and well built, but their clothing was reduced to a minimum. The various races were hunters, cultivation and pastoral pursuits being unknown. No game was too large for them to engage, and their whole life was founded on complete knowledge and accurate observation of the plant and animal life in their region. Their weapons were the bow and arrow, very small among the African tribes. They poisoned their arrows with a deadly vegetable poison. Their food consisted of everything edible in the animal and the vegetable kingdom. These little people were purely nomadic, without villages or large dwellings. With the doubtful exception of the Tasmanians, the Andamanese were the only people on record who did not know how to make fire. They

always kept a smouldering log in their camps, and carried the fire when travelling, the fire originally coming from voleanoes. The African Pigmies appeared to have no language of their own, using that of the adjacent tribes. They were good linguists. Counting was met with in its most primitive form. The drawings and paintings on the walls of their rock shelters were of considerable artistic value, being executed with great spirit and freedom of line and color. These little men also had a taste for music-making with stringed instruments.

EXCURSION TO THE GRANGE, AUGUST 30, 1924.—Although the tide was unfavorable for collectors interesting finds were made. Three species of phasiantrochus were included among the specimens. The nacreous internal coating of these used to be employed by the natives for earrings and necklaces. The little white bivalve *Mesodesman* seems to have a very acute sense of sound, and often narrow winding furrows ploughed by this tiny mollusc before the oncoming tide led to its discovery by the zealous collector. The peculiar habits of that ingenious little creature the hermit crab *(Pagurus sp.)* were described. He constructs no dwelling for himself, but uses the cast-off shell of a mollusc for that purpose. This shell he carries about on his back till he finds another more suitable to his growing proportions. Into the latter he backs tail foremost, with his serrated claws and grips the edge and pulls the shell over his head. His hold is so firm that considerable force is required to wrench this shell from his grip. A shell of a Sydney rock oyster found on the beach led Mr. Kimber to caution young enthusiasts against being too ready to believe a new species had been found. Unless the living creature is found in the shell the find may prove, as in this case of the Sydney oyster, to be merely a castaway from some feast, or jettisoned from a ship. He exhorted younger members, however, to be always on the lookout for new molluscs, and related how on the last dredging trip three crustaceans apparently new to science had been brought up. A piece of rock caught by the dredger was on the point of being returned to the water when a member noticed in a narrow hole, 1½in. deep, a crab never before recorded as having been found on this side of the gulf, although Mr. Matthews had captured one near Edithburgh. Unlike the hermit this crab, not having a soft tail, does not carry his house about, but searches for food in the neighborhood of his retreat. On the slightest notice of danger he returns to his fastness, and with his claws above his head, clinging to the rock, he entrenches himself against all enemies. The manner in which

the boring mollusc can pierce the hardest timber, and even marble as in the case of the porphyry columns of the Serapeum, at Naples, was lucidly explained. The tiny soft-bodied creature, using its foot like a bradawl, can bore its way into the toughest wood or the hardest rock. The *pelecypoda* (axe footed) supplied an example of the mollusc's method of obtaining nutriment from the surrounding water. Making a burrow in the sand, it projects its two syphons above the opening. The water, containing carbonate of lime, various salts, and organic matter, enters through the lower syphon, circulates through the body of the mollusc, and when all the nutrient matter has been absorbed is ejected through the upper tube. In this way these tiny creatures serve a most useful purpose in purifying the water of the ocean. The building up of the shell with the solids obtained in the water was next explained from the protoconch (first shell), in which the minute organism finds its earliest shelter, to the successive whorls needed to accommodate the rapidly growing body. The maternal care is of a limited nature, and quickly at an end. Capsules containing from 10 to 20 eggs, and supplied with a store of albumen as food for the young, are deposited on a convenient rock, and there the mother's care is at an end.

EXCURSION TO WATERFALL GULLY, SEPTEMBER 6, 1924.—Under the leadership of Mr. W. H. Selway, a party visited Waterfall Gully. Eucalypts, casuarinas, banksia, and acacias were observed, also many aliens that have taken kindly to their new home. Wild flowers were very abundant. Two species of orchids were found. The fairylike *Drosera* (sundew), a most remarkable carnivorous plant, had its hairy, disc-like leaves well supplied with the flies and gnats whose curiosity had led them to an untimely end. Birds were not numerous, but several species were distinguished—the honey-eater, the mischievous Rosella, the purple-crowned lory, the graceful little blue wren, the robin. The sweet notes of the harmonious thrush were blended with the harsh cry of the noisy minah. The Australian brown fly catcher was also seen.

EXCURSION TO LONG GULLY, OCTOBER 4, 1924.—One of the most pleasant trips of the year was that made to Long Gully, under the leadership of Professor T. G. B. Osborn. The members remarked on the extraordinary profusion of wildflowers, due to the bountiful rains during September. Attention was drawn to the striking variations of native flora according to situation and aspect. On the wettest part, along the exposed ridge, the stringybark *(E. obliqua)* dominated the landscape. With

these trees were associated the shrub *Acrotriche fasciculiflora.* Great masses of georgeous lemon-tinted *Pultenaea daphnoides* (native wallflower) imparted a yellow tinge to the scenery, the beauty of which was further enhanced by the golden blossoms of guinea flowers *(Hibbertia).* On the saddle, above the tunnel, the stringybark was replaced by *Eucalyptus fasciculosa* (pink gum), and an occasional *E. leucoxylon* (yellow gum). In the gully the predominant vegetation consisted of *E. viminalis* (manna gum), and blackwood. Orchids were represented by several species of *Pterostylis* (Greenhoods), *Glossodia major,* and *Diuris.* Among acacias *A. myrtifolia* (myrtle-leaved wattle) was displaying its pale yellow bloom. Attention was drawn to a very obscure but interesting little plant, a species of liverwort, known botanically as *Anthoseros.* This modest species is related to the earliest plants found in the old red sandstone which anticipated the ferns by some milleniums. The effects of burning on the vegetation was observed in a great patch of brown moss *(Funaria).* These primitive forms prepare the soil for the highly organised plants by adding to the mineral salts left by the fire a necessary proportion of humus, the result of their own decay. Many other native growths were noted, including *Daviesia, Dillwynia, Scaevola, Leucopogon, Hakea,* and *Hardenbergia.* The dainty purple flowers of *Tetratheca pilosa* were much in evidence, and added a pleasing variety to the prevailing yellow tints.

EXCURSION TO MOUNT COMPASS, OCTOBER 8, 1924.—The Eight Hours Celebration Day gave an opportunity for members to go as far afield as Mount Compass. Members found the wild flowers abundant and varied. Mr. W. Champion Hackett acted as leader. Several species of native flora peculiar to the district were discovered, such as *Zieria* and *Correa rubra,* with its beautiful red tubular corolla. Different specimens of *Drosera* were found in the marshy flats; also *Pimelea, Comesperma, Chamaescilla, Sprengelia incarnata, Leucopogon, Isopogon,* and *Haloragis* (sea berry), *Patersonia* (native iris), *Xanthosia pusilla, Restiaceae, Adenanthos,* and the lovely pale-pink or white *Euphrasia Brownii* (the flower of gladness). On the elevated slopes appeared *Epacris impressa, Helichrysum, Poranthera, Cheiranthera,* a beautiful blue with yellow anthers, *Boronia caerulescens* (blue boronia), *Daviesia* (with triangular pods and prickly leaves), *Dillwynia,* and the beautiful pink and scarlet *Grevillea.* Orchids found included *Caladenia, Diurus, Glossodia major, Pterostylis,* and *Thelymitra.* Among the trees and shrubs the pale blossoms of *Acacia verticillata* and *A. myrtifolia* attracted attention. Eucalyptus of several species and banksias were also noted. Collections were made for botanical purposes, and for the forthcoming wildflower show.

EVENING LECTURES—"Methods of Casting Replicas of Natural Objects," by Mr. Edgar R. Waite, F.L.S., Director of the South Australian Museum, and "Forest Needs of South Australia," by Wm. Ham, F.R.E.S., October 21, 1924:—

Mr. Waite gave a very lucid exposition of the methods adopted in making replicas of natural objects for Museum purposes, illustrating his remarks by a fine collection of casts, models, and natural objects, such as snakes and fish. The old method of exhibiting such objects by stuffing the natural skin were shown to result rather in caricatures than replicas. The new methods of making exact copies were shown, the replicas, whether in plaster or flexible material, being coloured in life-like tints. The snakes and fishes now on view in the Museum illustrate the absolute accuracy of the counterfeit presentments so obtained. Indeed visitors have been known to approach the attendants protesting that they saw one of the snakes move. Great is their surprise when the snake turns out to be merely a rubber-like copy of the original so absolute is the fidelity of the casting so obtained.

Mr. Ham followed and spoke on "Australia's Great Need for Increased Afforestation," giving a short description of some of the many suburban forests of Europe. The first part of the lecture was published by the "Register," on October 24, 1924. The second part took the form of an imaginative account of what the surroundings of Adelaide might become in 50 years, if the plans of this and other Societies were carried into effect by tree-planting near the city in suitable places, such as the land now on offer to the Government on the west side of Mount Lofty. By the kind permission of the "Register," in which it was published on October 31st, 1924, we are enabled to reproduce the second part of the lecture, which is reprinted by the special request of members. This part of the lecture took the form of an extract from the "Register," of October 29, 1974 (held over): — "We are in receipt of an advance copy of the report of the American Commission on Town Planning which visited our city in the early part of this year, in order to report to the Federal Government of the United States on the most recent developments in the laying out and improvement of cities. Our readers will remember that the six members of the commission arrived from Los Angeles by aeroplane, taking 72 hours to reach Sydney. After inspecting Sydney and Canberra, the party continued their flight to Adelaide, where they spent 12 days. The report itself is a work of art, the pictures with which it is profusely embellished being some of the finest specimens of the new natural colour stereoscopic-effect printing that we have seen. The members express themselves as en-

raptured with the civic adornment of Adelaide. They say, inter alia:—The city of Adelaide, with a population of just over half a million, occupies a fertile coastal plain between the Mount Lofty Ranges and the sea, a distance of about 15 miles. With wise forethought the State Government has at various periods purchased various tracts of land comprising the foothills of the ranges facing the city, and during the last 50 years these tracts have been largely brought under forest, making a beautiful background to the city. Firebreaks divide the forest into irregular blocks, and many of these, especially those leading through the more picturesque gullies (as the Australians call canyons) are surfaced for car traffic. Aeroplanes and airships can land on these breaks, and this form of travel is widely availed of by the residents, whose beautiful homes cluster in the forest at all points of vantage. Some of these homes rival in pictureskuesness the famous palatial residences of our own Los Angeles, and all are surrounded by extensive and beautiful gardens.

Aerial Traffic.

The ground rents from these residential lands more than suffice to keep the roads in excellent condition for motor traffic. Most of the residents use their own 'planes, but regular liners ply at frequent intervals. The views from the forest, including as they do the tree-clad hills with cultivated valleys, the fertile plain with suburbs dotted among trees and gardens, with the city itself shining in the clear air, the tree-lined arterial roads radiating out in many directions from the city, the distant view of shipping backed by the blue waters of the gulf, all combine to make an ineffaceable impression of beauty and productiveness.

The commissioners were greatly struck with the fine situation of the mansions overlooking such fine sheets of water as Millbrook and the Fleming Reservoir, surrounded as they are by trees and gardens. The report grows almost lyrical in its description of the city, with its fine air, untainted by the reek of coal smoke through being supplied with exceedingly cheap firewood from the nearby State and civic forests. The report goes on to say:—The picturesqueness of the whole is enhanced by many sheets of water and pretty little waterfalls. The use of cheap cement dams along the streams has produced many small lakes and falls. Great supplies of underground waters have been tapped, especially along the line of Fenner's Fault, and these are being drawn upon by batteries of air motors installed at selected points. These give a service averaging 14 hours a day, raising the water to the highest reservoirs. Every valley has its truck gardens, and flourishing orchards of fruit trees line the slopes, the work being done by electric current derived from wind motors and streams. Since the formation of the forests, the streams run regularly all the

year round, the fallen leaves of the forest holding the water as in a sponge. We were informed that before tree planting was systematically attempted, the streams were dry through the greater part of the time, and became destructive torrents during a few days in the year.

Bellchambers and Other Forests.

The commissioners were particularly delighted with their visit to the Bellchambers Forest, where, for the first time, the members of the commission made close acquaintance with the Australian fauna. It was a novel experience for them to find kangaroos, wallabies, opposums, and native bears proving singularly tame and friendly. The members enjoyed a day's deerstalking in the Hughes Forest, and secured fine heads of mountain deer and mountain goat. A visit to White Forest enabled them to see Australian birds in this sanctuary. The figures in connection with the Cleland Park, recently extended to the Summit Station and hangar grounds, showing a net profit of 23/- per acre per annum, proved of great interest. In this connection the commissioners quote the well-known figures of 32/- per acre profit from the State forests as a whole, excluding, of course, the Sowden Museum of Sylviculture, the Ising Arboretum, and the Corbin Pinetum, which are maintained mainly for scientific investigation. The commission makes grateful acknowledgement of the world-wide influence of the Osborne Botanical Experimental Station, now established for 45 years, and lavishly endowed from private benefactions. The commissioners state that one investigation lately made by the station is likely to save the United States forest service at least two million dollars a year.

Profitable Timber.

The members expressed great surprise at the amount of private planting done through the ranges, but the figures obtained show that in suitable areas there is no crop so profitable as timber. They warmly approved of the regulation that in the proclaimed areas no tree should be cut down without the approval of the forest ranger. There are many eulogistic references to the tree planting and to the rivalry of suburbs with respect to their parks and arboretums. The commissioners were impressed with the effect of the enhancement of the beauties of the city by tree planting in attracting so many hundreds of families of means to settle in the garden city. They met scores of wealthy people who had been attracted by the beauty and healthiness of our city. The report draws particular attention to the economics of the forest. In addition to the immense revenue from timber, the secondary industries are a great benefit to the city, and the profitable em-

ployment in and about the forest has resulted in the abolition of the unemployed. Then there is the revenue from the great body of tourists who visit the forests, both in the ranges and in Flinders Chase, Kangaroo Island. The commissioners express their gratitude to many of our citizens, and particularly to that fine old gentleman, Sir Alec Morison, whose long and unrivalled acquaintance with the growth and development of Greater Adelaide was immensely valuable to the commissioners. Other well-known citizens, Sir Frederick Bailey (formerly of the Botanic Gardens) and Sir Geoffrey Ising (of the Forest Service), are among those most helpful in affording information and advice to the visitors. The report pays a high tribute to the work of the press in forming and fostering an active interest in forestry. Five thousand copies of the report are to be distributed by the S.A. Forest League, and we advise our readers who may be interested to make early application for copies."

LIST OF NATIVE PLANTS GROWING IN THE RAILWAY RESERVE, AT MILE END, No. 2.

My first list of plants was given in this journal, Vol. V., No. 2, p. iii., where 17 species are mentioned. The acacia sp. referred to is *A. ligulata* A. Cunn, which flowered from July to October, 1924, but still no pods have been observed. *Bassia enchylaenoides* given on page 112 should be corrected to *Enchylaena villosa* F.vM. ("Flora of South Australia, Part II.," J. M. Black, p. 201, 1924.)

Gramineae. *Stipa eremophila* Reader.—A grass growing to three feet in height, and is fairly plentiful, but is not so abundant as *Stipa scabra*. This species is taller and more erect than the latter, and is distinguished by the golden-brown pubessence of the flowering glumes. Flowering in October.

Cyperaceae. *Cyperus vaginatus* R.Br.—A rush plant, only one of which has been seen. It is growing in a dry situation, and flowered in October.

Iridaceae. *Moraea xerospatha* MacOwan, var. monophylla, J. M. Black.—Quite a common plant and conspicuous with its pale purple flowers, which open in October. This Australian variety, with one leaf, differs from the African type, which has three to four leaves.

Caryophyllaceae. *Sagina apetala* Ard.—A tiny annual growing all over the Adelaide plains on footpaths and open lands. Flowering in early spring.

Spergularia rubra (L.) J. et C. Presl.—Also growing over the plains, and the previous species usually associated with it. Flowers in October and November.

Leguminosae. *Acacia Victoriae* Benth.—Mr. Black ("Flora of South Australia, Part II.," 1924, p. 277) records this species as far south as Brighton, so that it is not surprising to meet with it at Mile End. It extends to the Far North. It is not flowering this season, and only one shrub is recorded.

Rubiaceae. *Asperula oligantha* F.vM.—A small plant of several inches in height, and just a few specimens were observed. Flowering in October.

Goodeniaceae. *Goodenia pinnatifida* Schlecht.—I discovered a little patch of these plants, comprising an area of about four square yards, not seen elsewhere. There are several hundred plants in the colony; they seed freely and evidently germinate easily, as the plants are now spreading down the side of a cutting. Flowering takes place in October and November.

SOUTH AUSTRALIAN AQUARIUM SOCIETY.—The annual meeting was held at the room of J. W. Hosking, Parade, Norwood, on November 4th, 1924. The annual report and balance sheet presented showed satisfactory progress. The following were elected as the officers for the ensuing year:—President, Mr. B. B. Beck; Vice-President, Mr. S. Stokes; Hon. Secretary and Treasurer, Mr. M. H. Hale; Committee, Miss Roeger, Messrs. J. W. Hosking, F. K. Boase and R. Carpenter. The meeting discussed an application from the Chamber of Commerce asking that the society should make an exhibit at the forthcoming show in March and April, 1925. It was resolved to comply with the request.

On Saturday, November 8, the members paid a visit to the private aquarium of the President, at Fullarton. The collection of fishes includes many rare native and exotic specimens. Among others the party were greatly interested in the "Congolli" *(P. seudaphrites urvilli).* A scientific description of this fish, by Mr. Edgar R. Waite, recently appeared in the "Museum Record" of South Australia. Other notable specimens included the Paradise fish, sword-tails, golden and brown carp, and many others. A large variety of water weeds were inspected by the party and valuable hints were given by the President on the management of tanks and the feeding and care of fish life generally.

OUR LIBRARY.

The following additions have been made to the Library:—

1. "All About Leaves," by Francis George Heath, with 80 photo blocks and 4 colored plates. This little book contains interesting descriptions of many well-known plants.

2. "The Mysteries of the Flowers," by Herbert W. Faulkiner, Ph.B.

EXCHANGES.

"The Victorian Naturalist," for September and October, 1924. The October number contains an interesting account of an excursion in South-West Queensland by Dr. W. McGillivray, of Broken Hill.

"The Queensland Naturalist," for September, 1924.

Professor T. G. B. Osborne's three lectures on "South Australian Plants in their Native Haunts," given in July last as University extension lectures were a great treat to all interested in Botany. The lecturer dealt with the Mount Lofty type of forest, and that of the plains, the scrubs and the wonderful saltbush, as well as with the interesting flora of the outlying islands off the coast of Eyre Peninsula.

Mr. E. H. Matthews, of the Semaphore, known to many of our members as an enthusiastic student and collector of marine life, has just returned (with half a ton of specimens) from an interesting collecting trip on the Great Barrier Reef and the island beaches of N. Queensland. His special study was chitons, of which he has brought back at least two new species. He found the climate delightful.

BALANCE SHEET, GENERAL ACCOUNT, FOR YEAR ENDING 30th AUGUST, 1924.

Receipts.	£	s.	d.
Balance Brought Forward	6	14	2
Wild Flower Show	27	19	0
Subscriptions	52	12	3
Grant	50	0	0
Sale of Badges, Etc.	1	7	8
Bank Interest	0	16	6
Additional Subscriptions in Hand	1	2	6
	£140	12	1

	£	s.	d.
Subscriptions due Royal Society	1	9	6
Balance	10	11	8
	£12	1	2

Expenditure	£	s.	d.
Postages	14	11	3
Printing	45	2	3
Stationery	6	4	3
Wild Flower Show Prizes	2	3	4
Library Books	0	10	0
Advertising	1	3	0
Hire of Hall	6	3	1
Telegrams, Etc.	0	8	6
Subscriptions Paid to Royal Society	52	5	3
Balance in Bank due to Royal Society	1	2	6
Cash in Hand	0	7	0
Balance in Bank	10	11	8
	£140	12	1

EXCURSION ACCOUNT.

Receipts.	£	s.	d.
Balance Brought Forward	3	18	9
Fares	74	16	9
	£78	15	6

	£	s.	d.
To Balance	3	5	3

Expenditure.	£	s.	d.
Hire of Motors	66	10	0
Refreshments, Etc.	1	0	3
Hire of Launches	7	0	0
Tips to Sailors	1	0	0
Balance	3	5	3
	£78	15	6

Audited and found correct.

(Signed) ALEC. J. MORISON
(Signed) WALTER D. REED, F.C.P.A. } Auditors.

Adelaide,
15th September, 1924.

The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia.

Adelaide

Feb., 1925

VOL. VI.

No. 2.

CONTENTS.

The authors of papers are responsible for the facts recorded and opinions expressed.

Address of the Section: C/o Royal Society's Rooms, Institute Building, North Terrace, Adelaide.

Published Quarterly **Single Copy—NINEPENCE**

Obtainable from Cole's Book Arcade, No. 14 Rundle Street, Adelaide.

Felstead & Ormsby, Printers, Gilbert Place, Adelaide. 'Phone C. 1531

Field Naturalists' Section of the Royal Society of South Australia.

Office Bearers, 1924-25.

Chairman—Mr. E. S. Hughes.

Vice-Chairman—Prof. T. Harvey Johnston, D.Sc.

Hon. Secretary—Mr. E. H. Ising, Loco. Dept., Railway Station, Adelaide.

Assistant Hon. Secretary and Assistant Treasurer—Miss E. Ireland.

Hon. Treasurer—Mr. B. B. Beck, Cole's Book Arcade, Rundle Street.

Hon. Librarian—Miss I. Roberts.

Hon. Press Correspondent—Mr. D. J. McNamara.

Hon. Magazine Secretary—Miss M. Roeger.

Committee—Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Messrs. J. F. Bailey, Wm. Ham, F.R.E.S., W. H. Selway, W. J. Kimber, W. Champion Hackett, F.R.H.S., C. Pearce, A. J. Morison and J. A. Hogan, Miss Roeger, and the Chairman and Secretary of the Flora and Fauna Committee.

Hon. Auditors—Messrs. W. D. Reed, F.C.P.A., and A. J. Morison.

Fauna and Flora Protection Committee—Captain S. A. White, C.M.B.O.U., Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Prof. F. Wood Jones, D.Sc., Messrs. E. Ashby, F.L.S., M.B.O.U., W. H. Selway, J. M. Black, J. F. Bailey, A. H. Elston, F.E.S., A. M. Lea, F.E.S., F. Angel, W. Champion Hackett, F.R.H.S., B. B. Beck, J. Neil McGilp, A. J. Morison, and J. Sutton, and Mrs. W. Champion Hackett.

"The South Australian Naturalist," Editor—Mr. Wm. Ham, F.R.E.S., The University, Adelaide.

Business Committee—Miss Roeger, Mrs. Day, and Mr. J. Sutton.

FORTHCOMING EXCURSIONS.

PROGRAMME 1925.

March 14—Mount Lofty. Train, 2.3 p.m. Flower Show. Mr. A. J. Morison.
March 28—Seacliff. Train, 1.48 p.m. "Botany." Mr. G. Beck.
April 25—Anzac Day. Kuitpo Forest. Charabanc, 9 a.m. "Forestry." Mr. H. H. Corbin, B.Sc. Book seats at Cole's Book Arcade.
May 9—Horsnell's Hill. Kensington Gardens Tram, 2 p.m. "Botany, etc." Mr. W. H. Selway.
May 23—Morialta. Tram, 2 p.m. "Native Flora." Prof. J. B. Cleland.

EVENING MEETINGS.

March 17—Natural History Books—Our Library. Mr. B. Beck and Miss I. Roberts. Members are invited to exhibit books and specimens.
April 21—"Wilpena Pound, Flinders Range." Messrs. Hale and B. Beck. Lecture Room.
May 19—"Travels in the Pacific." Mr. A. M. Lea, F.E.S. Lecture Room.

The

South Australian Naturalist.

VOL. VI. ADELAIDE, FEBRUARY, 1925. No. 2.

ARE WE MERELY CRANKS?

Members of a nature-loving society such as ours are very usually pictured as merely cranks, harmless possibly, but certainly useless. Picking flowers and impaling beetles are very generally thought to form the sum total of our activities. As a matter of sober fact the field study of nature has been the basis of improvements and inventions of enormous economic importance to the world.

As regards our own State, to name but one suitable activity, there is a great field for public service in the advocacy of a progressive policy of afforestation for South Australia. The study of forests shows that one of their main functions is that of preventing torrential floodings. Had the 6½ inches, which fell recently on the plains of the city, fallen on the hills irreparable damage would have been caused by the washing away of fruitful soils from places denuded by man of their natural covering of vegetation. One remedy lies in the preservation of our forested areas in the hills and in addition to the meagre reserves now set apart for the conservation of the natural protection of the soils.

The careful perusal of that most informative volume, "A Discussion of Australian Forestry," by the late D. E. Hutchins, just presented to our library by the Western Australian Forestry Department, would enable every member to acquire some knowledge of the immense importance of this question, particularly as it affects South Australia.

The Section is at present trying to preserve the geologically-famous Selwyn Rock at Hallett's Cove. The Section should press on with the work of securing additional reserves.

THE PLANTS OF THE ENCOUNTER BAY DISTRICT.

By J. Burton Cleland and J. M. Black.

One of us (J. B. C.), having spent various holidays at Encounter Bay, determined to collect as far as possible all the plants of this locality. To ensure accuracy his determinations have been checked by the other of us (J. M. B.) or the unindentified plants have been determined. Mr. J. H. Maiden has seen and identified specimens of all the Eucalypts, whilst Dr. R. S. Rogers has identified or confirmed the orchids and has added personal records of his own. The area embraced in this survey extends from Middleton on the east to Tunkalilla Beach and Road, more than halfway between Encounter Bay and C. Jervis, on the west. The Inman Valley to the Bald Hills is included, as well as the Upper Waterfall in the Hindmarsh Valley, within two miles of Hindmarsh Tiers School. The Mount Compass and Myponga districts are excluded. Occasional records of plants in adjacent areas are included in heavy brackets [....].

To make the list complete, plants previously recorded for the district, but not collected by us, have been included. These are few in number (about 21) and such previous record is indicated. In Dr. Rogers' list of orchids are a further 20 species which we have not yet collected ourselves. The total number of plants in this list is approximately 603 (excluding 10 varieties), of which about 100 (104) are introduced species (indicated by * before the name). The survey has resulted in the finding of an orchid new to science *(Microtis sp.)*, to be named by Dr. Rogers, one species *(Schoenus fluitans)* new for the mainland, and one of us (J. M. B.) has named one new variety *(Cyperus Eragrotis* var. *pauperata)*. *Daviesia pectinata*, a Port Lincoln plant, was found at Waitpinga. *Pultenaea teretifolia*, another Eyre Peninsula plant, was also collected here for the first time. *Eucalyptus cneorifolia*, the Kangaroo Island oil-mallee, given by Maiden for Kangaroo Island only, was met with. *Correa reflexa* was found at Waitpinga sufficiently early to be included in Black's "Flora of South Australia." The Porcupine Grass *(Triodia irritans)* was noticed at Waitpinga, a considerable distance from other known occurrences. It is hoped that later this list may be supplemented by some ecological notes.

FILICALES.—Lindsaya linearis, Swartz, in swamp at Back Valley and on Yankalilla side of S. of Mt. Hayfield, Tunkalilla Rd.; *Adiantum aethiopicum*, L., maiden hair; *Chcilanthes tenui-*

folia, Swartz, carrot fern; *Pteridium aquilinum* (L.), Kuhn, bracken; *Blechnum capense* (L.), Schlecht; *Asplenium flabellifolium,* Cav., Waterfall, Upper Hindmarsh Valley; *Gymnogramme leptophylla* (L.)., Desv., Hindmarsh Valley; *Pleurosorus rutifolius* (R.Br.), Fee, Waterfall, Upper Hindmarsh Valley; *Schizaea fistulosa,* Labill., comb fern, in peaty soil, Back Valley off Inman Valley.

LYCOPODIACEAE.—Lycopodium laterale, R.Br., in peaty soil, Back Valley; *Phylloglossum Drummondii,* Kunze, Upper Hindmarsh Valley.

SELAGINELLACEAE. — Selaginella Preissiana, Spring, Hindmarsh Tiers.

ISOETACEAE.—Isoetes Drummondii, A.Br., Quillwort, recorded in Black's "Flora" for Victor Harbour.

TYPHACEAE.—Typha angustifolia, L., Bulrush, Inman Valley.

POTAMOGETONACEAE.—Zostera nana, Roth., in sea meadows; *Z. tasmanica,* G. V. Mart.; *Cymodocea antarctica* (Labill.), Endl., a sea-grass; *Posidonia australis,* Hook.f., fruits and stems washed up.

SCHEUCHZERIACEAE.—Triglochin striata, Ruiz et Pav.; *T. procera,* R.Br.

GRAMINEAE. — Imperata cylindrica (L.), Beauv., blady grass, in semi-swamp patches; *Rottboellia compressa,* L.f., mat grass; *Themeda triandra,* Forsk., kangaroo grass; *Neurachne alopecuroides,* R.Br.; **Paspalum dilatatum,* Poir.; *Isachne australis,* R.Br., swamp in the Upper Hindmarsh Valley (also at Black Swamp); *Panicum gracile,* R.Br., cliffs at the Bluff; **Pennisetum villosum,* R.Br., a few patches of this usurping and rather useless grass have appeared on the Bluff and adjacent areas; **Stenotaphrum dimidiatum* (L.), Brogn., buffalo grass; *Spinifex hirsutus,* Labill., sandhills; *Microlaena stipoides* (Labill.), R.Br.; **Phalaris minor,* Ritz, Jan.; *Amphipogon strictus,* R.Br. and *A. strictus* var. *setifer,* Benth., on stony hills; *Stipa setacea,* R.Br., var. *latiglumis,* Black, Jan.; *S. semibarbata,* R.Br., Jan., on sandhills near the coast; *Echinopogon ovatus* (Forst), Beauv., Waterfall in Upper Hindmarsh Valley, Jan.; *Sporobolus virginicus* (L.), Kunth, near

the sea; **Polypogon monspeliensis*, Desf., beard-grass; *Calamagrostis filiformis* (Forst.), Pilger, Encounter Bay; *C. filiformis* var. *Billardieri*, Maid. et Betche, blown grass, near the sea, Jan.; *C. quadriseta* (Labill.) Spreng., Jan.; *C. minor* (Benth.), J. M. Black, Jan.; **Gastridium lendigerum* (L.), Gaudin, nitgrass, Jan.; *Dichelachne crinita* (L.f.), Hook.f.; **Ammophila arenaria* (L.), Link., Marram grass, planted in the sand; **Lagurus ovatus*, L., hare's-tail grass, abundant in summer in the sandhills near the sea; **Aira caryophyllea*, L., silvery hair-grass; **Avena fatua*, L., wild oat; **Holcus lanatus*, L., Yorkshire fog, in semi-swampy soil, Jan.; *Amphibromus nervosus* (R.Br.), Hook.f., Nov.; *Danthonia carphoides*, F.v.M.; *Danthonia penicillata* (Labill.), F.v.M., wallaby grass; *Triodia irritans*, R.Br., several large clumps near the sea at Newland's Head and a patch near Waitpinga Beach; *Phragmites communis*, Trin., common reed, Inman R.; **Briza maxima*, L., large Quaking-grass; **B. minor*, L., lesser Quaking-grass; **Dactylis glomerata*, L., Cock's-foot-grass; *Eragrostis Brownii*, Nees, Jan.; *Distichlis spicata* (L.), Greene, near the sea, infected with a smut; *Poa caespitosa*, Forst., Jan.; **P. annua*, L., annual meadow-grass; *Glyceria stricta*, Hook.f., Jan.; **Festuca bromoides*, L.; **Bromus maximus*, Desf., great brome; **Bromus unioloides*, H.B. et K., prairie grass; **B. hordeaceus*, L. (*B. mollis*, L.), soft brome; **Cynodon dactylon*, Rich., couch grass; **Lolium temulentum*, L., Darnel, Drake, Nov.; **L. perenne*, L., rye-grass; **L. subulatum*, Vis.; *Lepturus incurvatus*, Trin., Nov.; *Agropyrum scabrum* (Labill.), Beauv.; **Hordeum murinum*, L., barley-grass.

CYPERACEAE.—Cyperus eragrostis, Vahl., spring behind Bluff; *C. eragrostis* var. *pauperata*, J. M. Black, spring behind Bluff, the variety founded on these specimens; *C. tenellus*, L.f., spring behind Bluff, Inman R.; *C. vaginatus*, R.Br., common; *C. Gunnii*, Hook.f., Hall's Creek, (Black Swamp); *Schoenus apogon*, Roem. et Sch., on dry hills; *S. brachyphyllus*, F.v.M., hills above Hindmarsh Valley; *S. fluitans*, Hook.f., behind Encounter B., the first record beyond Kangaroo Island for S. Aus.; *S. tenuissimus* (Hook.f.), Benth., recorded in Black's "Flora" for Encounter Bay; *Heleocharis acuta*, R.Br. (also at Black Swamp); *H. multicaulis*, Sm., Back Valley; *Scirpus fluitans*, L., spring behind the Bluff; *S. cernuus*, Vahl.; *S. antarcticus*, L., in sand, Inman R., Nov., Jan.; *S. inundatus* (R.Br.), Poir. (also at Black Swamp), Jan.; *S. nodosus*, Rottb., one plant with very long spikes; *S. americanus*, Pers., Middleton; *S. lacuster*, L., Inman R., (Second Valley); *S. maritimus*, L., Middleton Creek (style branches 2); *Chorizandra enodis*, Nees, in dry swamps; *Cladium*

junceum, R.Br.; *C. Mariscus* (L.), Pohl., Upper Waterfall of Hindmarsh R., (Black Swamp); *C. articulatum,* R.Br. (Black Swamp); *C. filum* (Labill.), in tussocks in low land behind the sandhills; *C. acutum* (Labill.), Poir.; *C. glomeratum,* R.Br.; *Gahnia trifida,* Labill., cutting-grass; *G. deusta* (R.Br.), Benth.; *G. psittacorum,* Labill., Back Valley; *Lepidosperma exaltatum,* R.Br., Inman R.; *L. gladiatum,* Labill., sandhills; *L. concavum,* R.Br. (approaching), forming tussocks on grass land at King's Pt.; *L. laterale,* R.Br.; *L. lineare,* R.Br.; *L. viscidum,* R.Br.; *L. canescens,* Boeck.; *L. semiteres,* F.v.M.; *Carex appressa,* R.Br.; *C. tereticaulis,* F.v.M.; *C. pseudocyperus,* L., Back Valley; *C. pumila,* Thunb., var. *Bichenoviana,* Kukenth., Hindmarsh Valley.

RESTIONACEAE.—Leptocarpus Brownii, Hook. f., these plants are monoecious; *Hypolaena fastigiata,* R.Br.; *Lepidobolus drapetocoleus,* F.vM.

CENTROLEPIDACEAE.—Brizula gracilis (Sond.), Hieron; *Centrolepis glabra* (F.vM.), Hieron; *C. fascicularis,* Labill.; *C. strigosa* (R.Br.), Roem et Schult.

XYRIDACEAE.—Xyris operculata, Labill., Back Valley, off Inman Valley.

*JUNCACEAE.—*Juncus capitatus,* Weig.; *J. bufonius,* L., toad rush; *J. planifolius,* R.Br.; *J. caespiticius,* E. Mey; *J. holoschoenus,* R.Br., Hall's Creek (also at Black Swamp); *J. maritimus,* Lamh. var. *australiensis,* Buch; *J. pallidus,* R.Br., pale rush; *J. polyanthemus,* Buch; *J. pauciflorus,* R.Br.; *Luzula campestris,* DC., field woodrush, Sep.

LILIACEAE.—Dianella revoluta, R.Br.; *D. laevis,* R.Br.; *Burchardia umbellata,* R.Br.; *Anguillaria dioica,* R.Br.; *Lomandra dura* (F.vM.), Ewart; *L. effusa* (Lindl.), Ewart, on the Bluff; *L. glauca* (R.Br.), Ewart; *L. juncea* (F.vM.), Ewart; *L. leucocephala* (R.Br.), Ewart, in sandy soil near the lower part of the Inman R.; *Thysanotus Patersonii,* R.Br., Nov.; *Th. dichotomus* (Labill.), R.Br.; *Caesia vittata,* R.Br., Aug., Sep.; *Chamaescilla corymbosa* (R.Br.), F.vM., Sep., one plant albino; *Tricoryne elatior,* R.Br.; *Bulbine bulbosa* (R.Br.), Haw., Aug., Sep.; *Dichopogon strictus* (R.Br.), J. G. Bak.; *D. fimbriatus* (R.Br.), J. M. Black; *Bartlingia sessiliflora* (Dcne), F.vM., Sep.; *Xanthorrhoea semiplana,* F.vM., running into *X. Tateana,* F.vM.—many of the plants have short stems, occasionally 5ft. or more high and branched; **Asphodelus fistulosus,* L., wild onion, Pt. Elliot.

AMARYLLIDACEAE.—Hypoxis glabella, R.Br., Aug., Sep.; *H. pusilla,* Hook.f., Aug.; *Calostemma purpureum,* R.Br., Waitpinga, Jan.

IRIDACEAE.—Patersonia longiscapa, Sweet; *P. glauca,* R.Br., a considerable number of plants in the sandy soil behind the Bluff; **Romulea parviflora* (Salisb.), J. Britten, Aug.; **Iris germanica,* L., German Iris, white flowers, a garden escape; **Moraea xerospatha,* MacOw.

ORCHIDACEAE. — Thelymitra ixiodes, Sw., Encounter B. and Inman Valley (Rogers); *T. azurea,* Rogers, between Mt. Compass and Pt. Elliot (Rogers); *T. epipactoides,* F.v.M., Inman Valley (Rogers); *T. luteo-ciliata,* Fitz., Aug.; *T. carnea,* R.Br., *Inman Valley* (Rogers); *T. flexuosa,* Endl., Inman Valley (Rogers); *T. antennifera,* Hook.f., Aug.; *Microtis porrifolia,* Spreng.; *M. orbicularis,* Rogers, hills near Encounter B.; *M.* sp., nov., to be described by Dr. Rogers, hills near Encounter B.; *Prasophyllum elatum,* R.Br., Pt. Victor district (Rogers); *P. odoratum,* Rogers, var. *album,* Rogers, Victor Harbour (Rogers); *P. nigricans,* R.Br., Victor Harbour (Rogers); *Acianthus caudatus,* R.Br., Victor Harbour (Rogers); *A. exsertus,* R.Br., Victor Harbour (Rogers); *Cyrtostylis reniformis,* R.Br.; *Lyperanthus nigricans,* R.Br.; *Leptoceras fimbriata,* Lindl., Pt. Elliot, Inman Valley and Pt. Victor (Rogers); *Caladenia Patersonii,* R.Br.; *C. latifolia,* R.Br., Inman Valley (Rogers); *C. deformis,* R.Br.; *Diuris maculata,* Sm., Aug.; *D. longifolia,* R.Br.; *D. brevifolia,* Rogers, Port Elliot (Rogers); *Orthoceras strictum,* R.Br., Victor Harbour, Inman Valley; *Pterostylis nutans,* R.Br.; *P. nana,* R.Br.; *P. alata,* Reich.f., Victor Harbour (Rogers); *P. obtusa,* R.Br., district of Victor Harbour (Rogers).

(Unpublished Additions by Dr. Rogers.)

Calochilus Robertsonii, Benth., Inman Valley; *Thelymitra aristata,* Lindl., Victor Harbour; *T. longifolia,* Forst., Hindmarsh Valley; *T. fuscolutea,* R.Br., Inman Valley; *Microtis atrata,* Lindl., Inman Valley; *Prasophyllum australe,* R.Br., Mt. Compass, Pt. Elliot; *P. patens,* R.Br., Victor Harbour, Inman Valley, Hindmarsh Valley; *P. fuscum,* R.Br., Victor Harbour, Inman Valley, Hindmarsh Valley; *Corysanthes fimbriata,* R.Br., Inman Valley, Hindmarsh Valley; *Eriochilus autumnalis,* R.Br., Inman Valley, Victor Harbour; *Caladenia cardiochila,* Tate, Victor Harbour (?), Inman Valley; *C. dilatata,* R.Br., Victor Harbour, Inman Valley, Hindmarsh Valley, Port Elliot; *Caladenia carnea,* R.Br., Inman Valley, Mt. Compass, Pt. Elliot; *Glossodia major, R.Br.,* Victor Harbour, Inman Valley; *Pterostylis pedunculata,* R.Br., Inman Valley, Hindmarsh Valley; *Pt. reflexa,* R.Br., Victor Harbour, Hindmarsh Valley, Inman Valley; *Pt. barbata,* Lindl., Inman Valley, Victor Harbour; *Pt. vittata,* Lindl., Victor Harbour,

Inman Valley; *Cryptostylis longifolia*, R.Br., Mt. Compass, Pt. Elliot; **Satyrium coriifolium*, Swtz., Pt. Elliot (native of Cape Colony, escaped from garden).

CASUARINACEAE.—Casuarina stricta, Ait.; *C. distyla*, Vent., occurring in two different forms but not apparently separable morphologically. The two forms often occur as separate communities, it may be adjacent to each other, and these often inosculate. The commoner form, which is usually the only one found in semi-swamp patches, is a coarser plant and in the case of the females at least, shows narrow projecting uppermost branches; is breast-high or higher (up to 14ft.); the female cones are frequently partly aborted, giving an uneven appearance; female plants are abundant but male plants to correspond are few, have a more rounded summit and seem to approach the males of the other form; in January only occasionally were flowers (females) seen. The other form (which may be termed *forma rotunda*) has a rounded summit, the branchlets are much more slender, is lower (1 to 3ft., sometimes flowering and fruiting when only a foot high), males and females are equally abundant, the plants often have a browner appearance, the female cones are more slender and rarely show the effect of abortions, and both sexes were flowering in January.

URTICACEAE.—Parietaria debilis, G. Forst.; Upper Hindmarsh Valley; *Urtica urens*, L., Small Nettle.

PROTEACEAE.—Isopogon ceratophyllus, R.Br.; *Adenanthos terminalis*, R.Br., sandy areas; *Conospermum patens*, Schlecht; *Persoonia juniperina*, Labill., widely scattered but nowhere abundant; *Hakea rostrata*, F.vM.; *H. rugosa*, R.Br.; *H. ulicina*, R.Br.; *H. ulicina* var. *flexilis*, F.vM., is found as a spreading prickly shrub near Victor Harbour and between Goolwa and Currency Creek; *Banksia marginata*, Cav.; *B. ornata*, F.vM.; *Grevillea ilicifolia*, R.Br., scattered shrubs in the scrub between Rosetta Head and Waitpinga; *G. lavandulacea*, Schlecht, the leaves very narrow leanceolate, rigid and distinctly prickly.

SANTALACEAE.—Exocarpus cupressiformis, Labill., Native Cherry; *E. aphylla*, R.Br.; *Leptomeria aphylla*, R.Br., Upper Hindmarsh Valley; *Choretrum glomeratum*, R.Br.; *Ch. spicatum*, F.vM.; *Fusanus acuminatus*, R.Br., Native Peach, Quandong, on limestone hills at Waitpinga; *F. persicarius*, F.vM., Bitter Quandong, Encounter Bay, Victor Harbour.

LORANTHACEAE.—Loranthus Exocarpi, Behr. on *Acacia melanoxylon* and *Exocarpus cupressiformis*, Hindmarsh Valley. Jan.; [*L. Preissii*, Mig., on *Acacia melanoxylon*, Hay's Flat, Yankalilla district]; *L. Miquelii*, Lehm. on *Eucalyptus fasciculosa, E. cosmophylla, E. viminalis* and *E. rostrata*, Hindmarsh Valley.

POLYGONACEAE.—**Rumex pulcher,* L., Fiddle Dock; *R. Brownii,* Campd.; **R. conglomeratus,* Murray, Clustered Dock; **R. crispus,* L., Curled Dock; **R. Acetosella,* L., Sheep-sorrel, in sour pastures; **Emex australis,* Steinh., Prickly Jack, Double-dee; **Polygonum aviculare,* L., Wireweed; **P. serrulatum,* Lag., [also at Black Swamp]; *Muehlenbeckia adpressa* (Labill.), Meisn.; *M. Cunninghamii* (Meisn.), F.vM., Lignum, at the mouth of the Hindmarsh R.

CHENOPODIACEAE.—*Rhagodia baccata* (Labill.), Moq., Coastal Saltbush, in the sandhills near the sea; *Rh. nutans,* R.Br.; **Chenopodium album,* L., White Goosefoot; **Ch. murale,* L., Nettle-leaved Goosefoot; *Ch. carinatum,* R.Br., Keeled Goosefoot; *Atriplex Muelleri,* Benth.; *Salsola Kali,* L., Prickly Saltwort, Rolly Poly, in the sandhills; *Suaeda australia* (R.Br.), Moq., near saltwater; *Enchylaena tomentosa,* R.Br., fruits yellow, occasionally red (Tunkalilla); *Threlkeldia diffusa,* R.Br., mouth of the Inman; *Salicornia australis,* Banks et Sol., Inman Mouth; *Salicornia pachystachya,* J. M. Black, recorded by Black for Pt. Elliot.

AMARANTACEAE.—*Trichinium exaltatum* (Nees), Benth.; *T. erubescens,* Moq., Nov.; *T. alopecuroideum,* Lindl.; **Amaranthus viridis,* L.; *Alternanthera denticulata,* R.Br.

PHYTOLACCACEAE.—*Gyrostemon australasicus* (Moq.), Heirmerl, a few plants in the sandy scrub near Hall's Creek.

AIZOACEAE.—*Mesembrianthemum aequilaterale,* Haw., Angular Pigface; *M. australe,* Sol., Round-leaved Pigface; *Tetragonia implexicoma* (Miq.), Hook., on the cliffs near the sea-shore.

PORTULACACEAE.—*Portulaca oleracea,* L., Purslane.

CARYOPHYLLACEAE.—**Cerastium glomeratum,* Thuill., Mouse-ear Chickweed; *Stellaria palustris,* Retz., Swamp Starwort, Waterfall in Upper Hindmarsh Valley; * *S. media* (L.), Vill., Chickweed, fields; *Spergularia rubra* (L.), J. et C. Presl., strong smell, Granite Island; *S. marginata* (DC.), Kitt, on rocks near the sea-shore, Granite Island, King's Point [also at Second Valley], Jan.; *Polycarpon tetraphyllum,* Loefl.; **Silene conica,* L., sandhills; **S. gallica,* L., French Catchfly; *Sagina apetala,* Arduino; *Scleranthus pungens,* R.Br., on top of the Bluff, Sep.

RANUNCULACEAE.—*Clematis microphylla,* DC.; *Ranunculus lappaceus,* Sm., Buttercup; *R. rivularis,* Banks et Sol., Upper Hindmarsh, Back Valley.

LAURACEAE.—*Cassytha glabella,* R.Br.; *C. melantha,* R.Br.

PAPAVERACEAE.—**Papaver dubium,* L., Long-headed Poppy; **Fumitaria muralis,* Sond., in fields.

CRUCIFERAE.—**Nasturtium officinale*, R.Br., Watercress; **Sisymbrium orientale*, L., Wild Mustard; **Diplotaxis muralis* (L.), DC.; *Lepidium hyssopifolium*, Desv.; *Cakile maritima*, Scop., Sea Rocket.

DROSERACEAE.—*Drosera binata*, Labill., in swamp, S. of Mt. Hayfield, Tunkalilla Rd., and Back Valley, off Inman Valley; *D. glanduligera*, Lehm.; *D. Whittakeri*, Planch; *D. pygmaea*, DC.; *D. Planchonii*, Hook.f.; *D. auriculata*, Backh.; *D. peltata*, Sm.

CRASSULACEAE.—*Crassula Sieberiana* (Schult.), Ostenf.

PITTOSPORACEAE.—*Bursaria spinosa*, Cav., Native Box; *Marianthus bignoniaceus*, F.vM., Tunkalilla Rd.; *Cheiranthera linearis*, A. Cunn.; *Billardiera cymosa*, F.vM.

ROSACEAE.—*Rubus parvifolius*, L., Native Raspberry, Inman Valley; **R. fruticosus*, L., Blackberry; **Rosa rubiginosa*, L., Sweetbriar; **R. canina*, L., Dog Rose; *Acaena ovina*, A. Cunn.; *A. Sanguisorbae* (L.f.), Vahl.

LEGUMINOSAE.—*Acacia armata*, R.Br.; *A. obliqua*, A. Cunn., Aug.; *A spinescens*, Benth., Encounter B., Hindmarsh Valley; **A. dodonaeifolia* (Pers.), Willd., escapes from hedges, Victor Harbour; *A. rhetinodes*, Schlecht, along creeks, sweet-scented, Jan. In the sand and limestone hills at Waitpinga (near Newland's Head) a form occurs as a neat umbrageous tall shrub or small tree, differing in habit from the straggling plants by the creeks or the more compact hill-side shrubs of the Mt. Lofty Ranges. "Judging by the pod, funicle and inflorescence, this is a short-leaved form of the variable *A. rhetinodes*, the phyllode approaching that of *A. microcarpa* but no other likeness. I can only see that the calyx is less thickly ciliate than in typical *A. rhetinodes*"—J. M. B. The bark brings in £1 a ton less than that from *A. pycnantha; A. ligulata*, A. Cunn., Victor Harbour; *A. myrtifolia* (Sm.), Willd.; *A. pycnantha*, Benth.; *A. melanoxylon*, R.Br., Blackwood [also on hills near Yankalilla]; *A. verticillata* (L'Her.), Willd.; *A. longifolia* (Andr.), Willd. var. *Sophorae*, F.vM., Waitpinga near the coast, Victor Harbour at the mouth of the Hindmarsh R.; *A. decurrens*, Willd. var. *mollis*, Lindl., escape, now forming thickets, Upper Hindmarsh Valley. *Gompholobium minus*, Sm., in sand, flowers all yellow, occasionally very pale; *Sphaerolobium vimineum*, Sm., Nov.; *Viminaria denudata*, Sm., Inman Valley [Mt. Compass]; *Daviesia corymbosa*, Sm., Hindmarsh Valley; *D. ulicina*, Sm., Jan.; *D. pectinata*, Lindl., a few plants on cliffs near the sea at Newland's Head; *D. brevifolia*, Lindl., in sand; *Eutaxia microphylla* (R.Br.), J. M. Black; *Pultenaea daphnoides*, Wendl.; *P. pedunculata*, Hook.; *P. laxiflora*, Benth., in swampy soil, Back Valley off Inman Valley;

P. teretifolia, H. B. Williamson; *P. largiflorens*, F.v.M. var. *latifolia*, H. B. Williamson; *P. trinervis*, J. M. Black, in sand; *P. acerosa*, R.Br.; *P. densifolia*, F.v.M., recorded in Black's "Flora"; *P. canaliculata*, F.v.M., var. *latifolia*, H. B. Williamson, Nov.; *Phyllota pleurandroides*, F.v.M., in sand; *Dillwynia hispida*, Lindl., Aug., Sep.; *D. floribunda*, Sm., Aug., Sep.; *Platylobium obtusangulum*, Hook., Sep.; *Bossiaea prostrata*, R.Br., Sep.; *Goodia lotifolia*, Salisb., Waitpinga Creek; **Ulex europaeus*, L., Furze; **Trifolium procumbens*, L., Hop Clover; **T. repens*, L., White Clover; **T. augustifolium*, L.; **T. fragiferum*, L., Strawberry Clover; **Melilotus indica*, All.; **Medicago tribuloides*, Desr., var. *truncatula*, Koch; **M. denticulata*, Willd.; *Lotus australis*, Andr., along the sandhills; *Indigofera australis*, Willd., along creeks; *Psoralea patens*, Lindl.; *Swainsona oroboides*, F.v.M., var. *hirsuta*, J. M. Black, Bluff; *S. lessertiifolia*, DC., Encounter Bay, and Waitpinga; **Vicia sativa*, L., Common Vetch; *Kennedya prostrata*, R.Br., Scarlet Runner; *Hardenbergia monophylla* (Vent.), Benth. Native Lilac; *Glycine clandestina*, Wendl.

A STUDY IN WEEDS.

By J. M. Black.

More than a year ago the open-air picture theatre on North Terrace, at the corner of Pulteney Street, was demolished. The seats were removed and holes remain in the tar-paved floor, where the legs of the seats were sunk. In these holes, where the tar-pavement has been broken away, a number of weeds have established themselves, most of them standing in rows, like flowers in a garden. Strongest in numbers is that common wayside weed, *Erigeron linifolius*, and some of the plants are 4ft. high, in spite of their cramped position. Next in numbers comes *Chenopodium album* (White Goosefoot). Of Stinkwort *(Inula graveolens)* there are only a few specimens at the east end of the floor, and several wireweeds *(Polygonum aviculare)* are spreading themselves over the tar here and there. There is one Cape Dandelion *(Cryptostemma calendulaceum)*. This, with the Stinkwort and the *Erigeron*, represent the composite family. Of grasses there is one wheat plant *(Triticum sativum)*, one *Bromus madritensis* and one *Setaria verticillata*. From two or three of the cracks are rising specimens of some shrub, only in early leaf, which I did not recognise. If they are due, as they seem to be, to the creeping stems of some garden shrub which flourished on the spot before the floor of the theatre was laid down, they are showing remarkable vitality. All the plants mentioned are introduced aliens.

SOUTH AUSTRALIAN AQUARIUM SOCIETY.

Towards the end of January members of the Society spent three days in camp at Port Willunga. They were fortunate in that tides were very low each day so that the party was able to spend a great part of the time on the reefs and to observe the many and varied forms of marine life found thereon. Anemones obtained on this occasion are now installed in Mr. Waite's marine aquarium. Visits were also made to Peddler's Creek in the vicinity, and fresh-water fishes and other specimens were collected.

The Society has been asked to install an aquarium at the forthcoming All-Australian Exhibition, and on February 10th a meeting was held for the purpose of arranging details of this exhibit. Mr. Waite announced that a larger space than was available for this purpose at the Peace Exhibition has been allotted, and it is hoped that an aquarium worthy of the interests of the Society will be erected.

On February 14th members spent a pleasant afternoon inspecting Mr. R. T. Foster's ponds and aquaria at the Grange; the Grange Creek was also visited under the guidance of Mr. Foster and towards the end of the afternoon tea was served by Mrs. Foster. The host and hostess were accorded a very hearty vote of thanks.

HERBERT M. HALE, Hon. Secretary.

BOTANICAL NOTES.

By Ernest H. Ising.

Loranthus pendulus Sieb.

In the "Flora of South Australia" (1) Mr. J. M. Black records this species from only three localities, viz., Blackwood, Dismal Swamp (South East), and north of Broken Hill Railway line. I can now record this plant from Mount Lofty, where I have found it growing on *Acacia melanoxylon*, *A. decurrens* (planted) and *Eucalyptus obliqua*. I have collected it from several separate trees of Blackwood (the former host) in a distance of one mile along the main road at Stirling. I have discovered an interesting variation in the number of flowers in each cymule in that, in all the above specimens, there are just as many series of fours as that of fives. Blakely (2), in the record of numerous specimens from all parts of Australia, only mentions the occurrence of four flowers in the cymule from one locality, viz., Mount Vincent, N.S.W. The four flowers were arranged thus:—Three in a row (with the central one sessile) and a lateral one. When the usual three flowers comprised the cymule they formed, as it were, a triangle.

Loranthus Preissii Miq.

This species I have collected at Mount Lofty on *Acacia melanoxylon* on February 8 this year and in flower. The shrubs are small and pendulous, although I have seen some erect in habit. On examining a number of flowers from two different plants I find that there is an interesting variation in the inflorescence not previously recorded. Blakely (3) mentions the petals as 5-6, but I have to record the occurrence of numerous flowers with 4 petals. Four specimens from two different shrubs were examined and the number of petals in each flower are shown below, the figures in sets of three are to represent each partial cyme, the blanks show that a particular flower in the cyme was missing.

Specimen	Petals in the three flowers of the partial cyme	Flowers with four petals	Flowers with five petals
No. 1	4,4,5; 5,4,4; 5,4,5; 5,--,5; 4,--,--; 5,5,--	6	8
2	5,4,4; 5,4,--; 5,--,--; 4,--,--	4	3
3	4,5,4; 5,4,4; 5,4,4; 5,4,5; 5,--,5; 4,4,5; 5,5,--; 5,5,4; 5,--,5;	10	14
4	--,4,4; --,4,4; 4,4,5; 4,5,4; 5,4,5; 4,5,4; 4,5,--	12	6
	Totals	32	31

It is remarkable that no partial cyme has flowers with the same number of petals to each flower, as will be seen in the above table the cymes have either 4 or 5-petalled flowers each.

(1.) Part II, 1924, p. 171.

(2.) "The Loranthaceae of Australia." Part III., Proc. Linnean Society of New South Wales, Vol. xlvii, part 4, 1922, p. 409b.

(3.) "The Loranthaceae of Australia," Part IV., Proc. Linnean Society of New South Wales., Vol. xlviii, part 2, 1923, p. 141.

A NOVEMBER DAY IN THE MOUNT LOFTIES.

Early November, the air warm, bright, balmy, with a tang of the scrub, made up of a faint odour of tea tree and eucalyptus, with a whiff of the native pine in it. Everywhere a light mantle of white, the silky tea tree *(Leptospermum myrsinoides)*—its relative *(L. scoparium)* will not be out for two or three weeks yet. Here and there the scrub is covered with the white blossoms, producing in the distance just the effect of a light snow-fall. This is added to by the spikes of "Eye-bright" *(Euphrasia Brownii* or *Collina* of the botanists), both typical of the worn down quartzite soils. On the rises and where the ground is drier and the drainage better, the beautiful white everlasting with yellow centre *(Helichrysum Baxteri)* is found in profusion. This is the mallee everlasting, in earlier days to be found covering many thousands of acres now given over to fallow, grass, and wheat. It is evident that white is the fashion at this time of the year. At other times the prevailing colour is yellow, and there are great masses of golden flowers here still, though the golden wattles have shed their fluffy stamens and have only greenish-yellow pods to show. Yellow everlastings take a second place now. One tires so soon of white! Let us look for blue. Ah! here we find the beautiful blue of the *Dampiera*. This is *D. rosmarinifolia*, its foliage like that of the rosemary. We can pick and pick at this, there is plenty and it bears cutting so well. The buds will open in water and you have a succession of the beautiful blue blossoms. Then in the bushes and between them in sheltered places one finds the "hand-flower," *Cheiranthera*, the most showy of all our blue native flowers. Look at the golden hand in its centre like a little glove with four fingers and distinct thumb, beautiful certainly, but too fragile to pick. And here is another blue flower, a pale-blue bell on a long twining stem, which climbs over and round and through the bushes to lift its pretty blue bells to the light and attract whatever insects its blossoms require for their pollenisation, which being duly accomplished, the plant will forthwith produce its dumpling fruits, small but with a daintiness of their own, for this is the climbing variety of *Billardiera, B. cymosa*, or "Sweet Dumpling." But I am out to find the queen of all our native flowers, the gorgeous blue orchid, *Thelymitra grandiflora* (the Great Sun-orchid), and here is one, standing eighteen inches high with fifteen dainty blue flowers, each enclosing the queer-shaped central case which children call the "baby in the cradle." In a little time there will be many scores of these dainty spikes of flowers spreading their silken petals to attract some particular insect whose taste (like mine) leads it to prefer blue. These orchids

never fail to remind me of charming ladies with dainty blue silk dresses and mauve bonnets. But this year we must come later than the first week of November to see them at their sweetest perfection. No lover of nature can reflect without sadness upon the slow but inevitable destruction of these beautiful flowers. Only the poverty of the soil has enabled them to escape the ruthless fire-stick or the engulfing ploughshare. A few short years and the flaunting charlock and the prickly thistle shall dance over the graves of a beauty gone beyond recall.

—W. H.

REVIEW.

"A BIBLIOGRAPHY OF FISHES," by Bashford Dean, edited and extended by Eugene Willis Gudger with the co-operation of Arthur Wilbur Henn; 3 volumes, American Museum of Natural History, New York.—"A painful work it is I'll assure you, and more than difficult, wherein that toyle hath been taken, as no man thinketh so no man believeth, but he that hath made the triall." To few books surely were such statement more applicable than to the three-volume memorial under notice. The work was not written with the certainty that it would be read, it cannot be read; it is a book that must be available to every worker on fishes throughout the world. The prefaces to Vol. I. and III. are, however, most readable and describe the operation of making the books. Though dedicated, so to speak, to ichthyologists, students of morphology, thinkers in evolution and others, will find much "meat" in the 2,000 odd pages required to contain a mass of information, the collection and collation of which must have been a stupendous undertaking. Writing privately on the subject of this Bibliography, the editor said:—"It has truly been a colossal task and had I known when I took the matter up some years ago how prodigious and nerve-racking it would be, I certainly would have hesitated before undertaking it. But now it is done." It is regretted that in such a small and local publication as the "S.A. Naturalist" no adequate review can be offered, but the authors will recognise our limitations and realise, in the few words printed, our deepest admiration for the work and assiduity and concentration of the workers. Tests on entries dealing with Australian Ichthyology, a subject with which we are somewhat acquainted, indicate that the references are *complete*, we can scarcely say more.

—E. R. W.

EXCURSION TO CHERRY GARDENS, NOVEMBER 15, 1924.—A large party of members visited Cherry Gardens on November 15th, under the leadership of the president, Mr. E. S. Hughes. The road passes through some of the most delightful scenery of the hills and the views obtained at different points of vantage are extensive, including the foothills with the great sheet of water in the Happy Valley Reservoir, the Adelaide plains in the distance backed by the blue waters of the Gulf. The beautiful Blue-button *(Brunonia australis)* was most abundant. This pretty little flower was named after Brown, the veteran botanist who accompanied Flinders on his voyage along the coasts of Southern Australia. It is purely Australian. To the botanist it is interesting from the fact that though it resembles a composite flower it is really a member of the great family of the Goodenias, of which other representatives such as Goodenias and Scaevolas were fairly common. Members noted with great regret the many clearings that have been made in the hills, particularly on the ridges, once crowned with a dense scrub, among which the wild flowers were found in abundance. It proved too late to find orchids, only one Thelymitra and a few Glossodias being taken.

EXCURSION TO MORIALTA, NOVEMBER 29, 1924.—Members travelled to Morialta, under the leadership of Mr. J. A. Hogan.

DREDGING EXCURSION, DECEMBER 15, 1924.—A party of members made an excursion into the North Arm of the Port River, on December 15th, under the leadership of Prof. T. Harvey Johnston and Mr. W. J. Kimber. It was intended to dredge about five miles out from Largs, but the rough weather prevented that. Several successful hauls were made and two species of sea-squirts *(Ascidians)* were collected. One *(Ciona sp.)* was of a translucent green and was larger than the other species which was chocolate-colored. Associated with these were some marine worms beautifully marked, with a circlet of highly colored tentacles at the head end, and the whole worm lodged in a tough flexible grey tube secreted by the animal. A common shrimp *(Leander sp.)* proved to be very much larger than the usual type. Another shrimp *(Latreutes sp.)* taken is unusual from its curious beak, which is flat and thick. A tiny worm-like crustacean yet possessed the usual seven pairs of legs. The phantom shrimp *(Caprella sp.)* was also taken. Several small crabs came under review, the most common one being named Elamena. The sand crab *(Ethalia sp.)* lives in the

sand and is only half an inch long. The hermit crab *(Eupagurus sp.)* was found living in the Murex shell. Several interesting shells were taken, one *(Pholas australiae)* burrows into rock by means of its foot, to make a home for itself. The nudibranchs or naked-gill molluscs, slug-like creatures, were most interesting. About 3 inches long; their dark-brown coloration with reddish borders make them brilliant objects. They breathe by means of lungs on their back, which are not enclosed in their bodies.

EXCURSION TO MOUNT CHARLES, CHARLESTON, DECEMEBER 20, 1924.—In response to a kind invitation from Mr. C. L. Simpson, a party of members visited the Mount Charles estate on Saturday, December 20th. The fine old gum-trees gave a picturesque aspect to the pleasant spot. The Corriedale sheep, a fine breed of pigs, and some good draught stock were among the many interesting animals inspected by the party, who were most hospitably entertained by Mr. and Mrs. Simpson.

DREDGING EXCURSION, JANUARY 31, 1924.—A large party of members, under the leadership of Mr. H. M. Hale, of the Adelaide Museum boarded the launch at the Outer Harbour, but found the water too rough to venture out into the Gulf. Hauls were confined mainly to the Harbor itself. Spider crabs, hermit crabs and sponge crabs, as well as many other crustaceans were taken, and the leader gave a short address on the habits of the various species caught. Mr. W. J. Kimber spoke on the mollusca and echinas (sea-urchins) dredged up. Hammer-headed oysters, starfishes, shrimps and lesser forms of sea-life were also taken as texts for talks on the wonderful adaptions of life in the seas.

LECTURE ON "TROPICAL FRUITS," BY MR. J. F. BAILEY, NOVEMBER 18, 1924.—A large audience was entertained and instructed by Mr. Bailey's lecture on the fruits of the tropics, and especially those grown in Queensland. A wealth of slides illustrated the lecturer's remarks. Among the fruits described by Mr. Bailey were the Durian, the Paw-paw, the passion fruits of many species, the mangoes, many varieties of citrus fruits and the coconut. The common fruits of Queensland, including many species of bananas and pineapples, were described. Peanuts, loquats, oranges and limes were dealt with. The lecturer referred to the many varieties of valuable trees, such as the cedar, grown in Queensland. Mr. P. H. Williams showed some very beautiful slides of native wild flowers taken at the Section's Wild Flower Show in the Town Hall. Mr. E. Thomas showed some fine slides of scenes in South Australia, New South Wales and the

Northern Territory. Mr. A. Wilkinson exhibited some of his beautiful scenes, which are rightly regarded as triumphs of the photographic art. The photos showed scenes from the most picturesque spots in the Mount Lofty and Flinders Ranges.

ADDITIONS TO THE LIBRARY.

1. "The Wonder of Life," by J. Arthur Thomson, M.A., LL.D. Brilliantly written and profusely illustrated, this book is compiled as an introduction to Natural History and Biology. It lays great stress on the wonders of the life about us and gives many illustrations of the cycle of life in insects and the lower animals.

2. "Science, Old and New," by the same author, contains a number of brilliant studies covering a wide range of natural history.

3. "Unscientific Essays," by Frederic Wood Jones, M.B., D.Sc., Elder Professor of Anatomy in the University of Adelaide. These charming essays should be read by all nature lovers. Here they may learn of many things from the kiss of the sooty devil to the deep glow of the elusive opal, from the dry opal fields of the Stuart Range to the tumbling billows that build up the shining coral islets of the Indian Ocean, the theological effects of a sail through the Hinchinbrook Pass, and why cocoanuts do not fall on men.

4. "The Kingdom of Dust," by J. Gordon Ogden, Ph.D.

5. "The Microscope," a simple handbook, by C. Beck, London, 1921. This splendid guide to the use of the modern microscope and its accessories has been presented to the Section by Messrs. E. Esdaile and Sons, Opticians, Hunter Street, Sydney.

6. "The Life of the Mollusca," by B. B. Woodward, of the British Museum, Past-President of the Malacological Society of London. This little book, profusely illustrated with carefully drawn figures, gives a well-written account of the Mollusca. The life-histories, so far as known, receive full treatment, while classification and distribution are dealt with. Every member will be able to find something of interest in this volume which will amplify and extend the lectures and drawings of Mr. Kimber and the other malacologists of our Section.

F.N.S. HERBARIUM.

The following additions have been made during the quarter:—

1. Mr. F. S. Jones, Oodnadatta, two parcels of 20 specimens.
2. Mr. H. J. Hillier, Gladstone, one parcel of about 40 specimens.

OUR EXCHANGES.

"The Australian Naturalist" (N.S.W.), October, 1924.

"The Victorian Naturalist," December and January numbers.

"The Queensland Naturalist," November number.

"Journal of the Arnold Arboretum," Harvard, U.S.A. This number deals with the trees of China.

"Forestry Bulletins," issued by the Forest Department, Western Australia. The Department has been kind enough to forward its Bulletins, Nos. 1 to 34. Each Bulletin deals with some aspect of forestry in Western Australia. Number 5, "A Discussion of Australian Forestry." In this, the late D. E. Hutchins, one of the most gifted and most experienced forestry experts who ever visited our shores, deals in most experienced, illuminating and interesting fashion with the problems of forestry in our different States. No. 34, "Key to the Eucalypts of Western Australia," by S. L. Kessell, B.Sc., Conservator of Forests and C.A. Gardner, is of special interest to students of botany. The set of Bulletins is a credit to the Department of Forestry in Western Australia.

"The S.A. Ornithologist," October, 1924.

Annual Report of the State Forest Administration in South Australia, 1923-24, by E. Julius, Conservator of Forests. This report gives the area of Forest Reserves as 206,109 acres, of which 28,217 acres are enclosed for planting. It seems a pity that the number of acres actually under forest is not given.

THE MUSEUM.

Members should make a point of visiting the Museum to see several new groups that have been recently installed by the Director and staff. One of these contains a large number of insects arranged in such a manner as to arouse interest in the minds of visitors. The principle of contrast is made great use of; for instance, one case, entitled "Giants and Dwarfs," shows the great differences in size that exist between insects of the same natural order; another, entitled "Males and Females," shows the great differences between the sexes of insects of the same order. A third shows a series of specimens arranged to illustrate the development of the foetus in the Kangaroo, three of the specimens having been removed from the uterus, or womb. This exhibit should settle once and for all the much debated question about marsupial birth.

NOTES AND OBSERVATIONS TAKEN BY A NATURE LOVER ON A TRIP UP THE RIVER MURRAY.

September or October is the best time of the year to take this trip. Starting on the s.s. "Gem," from Morgan, in beautiful weather, after very heavy rain, we passed many landing places, then Waikerie, which is thirty-nine miles above Morgan by river, and on Sunday at 1 p.m. we reached Berri. Here are the pumping station, and irrigation scheme, as at Mildura, only on a smaller scale. It has a settlement of over 23,000 acres. After discharging the cargo, and taking on more for the other villages, at 8 p.m. we drew up at Renmark, South Australia's first and principal irrigation settlement. As the sun dipped down, the shadows of the Eucalypts were beautifully reflected in the water, and the black duck, pelican, and cockatoos—white, pink, and grey—were seen in great numbers; and kookaburras were heard laughing in the gloaming; also the warble of the magpie. The swallows seemed to follow the boat all the way. Being attracted by hundreds of small holes in the cliffs, I was wondering what had caused them, and what made use of them, when my eye caught sight of a swallow entering one, so they must make the holes their homes. My attention was also drawn to a water-tower, where on the summit of the wall there were to be seen dozens of nests of these birds; it seemed from a distance they were built of the same color as the tower. They certainly had a township of their own up there, quite out of reach of the small boy. Passing one of the locks that is in course of construction, it was most interesting to see how the work is carried on. The men have their families with them, a good scheme, as it keeps the parents and children together. The houses are made of galvanised iron. The children and chickens were in great numbers all along the banks of the river. How all those children exist and look so healthy is a mystery; of course, the open air life is their salvation. The next turn brings us to some beautiful cliffs and hills that look as though they were made of grey stone, and dumped between red and yellow hills surrounding them. Fossiliferous remains are found in great quantities in the river cliffs between Murray Bridge and Overland Corner. In this section of the river the cliffs are of a marine limestone of Miocene and Eocene age.

Between Overland Corner and Loxton a remarkable change occurs, the cliffs above the boundary being unfossiliferous sandstone of Tertiary age, highly colored by iron oxide, probably of lacrustine origin. On Tuesday afternoon we arrived at Mildura;

there we found the roads of the town covered in mud. They had had a lot of rain. Motors had been phoned for to meet the boat, so we set out for the pumping station—the largest in Australia—and to see the settlers' blocks under irrigation. On the return journey I left the boat at Berri; there the vine is being cultivated over thousands of acres. The soil is quite red to look at, and sandy. Pears, oranges, Smyrna figs, &c., are all grown. The orchards are looking very lovely with their spring dresses. As you drive along the roads, you see on every side that lovely native flower the Cassia, or Australian Boronia—with its golden flower, and black centre, the wealth of bloom was gorgeous. The other settlements I drove through were Monash, Glossop, Barmera, and Lone Gum, the latter named after the one solitary gum that is growing there; it is a very high tree. No one seems to know how it got there, so far from the river bank, as it is a river red gum, that is always found on swampy ground, and there it is dry soil. Lake Bonney is about 12 miles from Berri, and it is beautifully situated, its area is four miles long and two and a half miles wide, surrounded by Eucalyptus trees, river red gum (*Eucalyptus rostrata*), box trees (*Eucalyptus bicolor*), which were both in blossom. The latter gives out a most delicate perfume. I was glad to hear the lake is a sanctuary for all birds and fish (thanks to Captain White's efforts). Neither gun nor fishing rod is allowed there. There the black swan, pelicans, and duck were swimming about in great numbers, also many kinds of birds were chirping and singing in the trees; crows with their usual call were continually passing overhead. Among the flora I found *Grevillea Huegellii, Cassia, Eremophila glabra, Acacia brachybotrya* (Silver Mulga), &c.

—A NATURE LOVER.

The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia.

Adelaide | May, 1925

VOL. VI. | No. 3.

CONTENTS.

The authors of papers are responsible for the facts recorded and opinions expressed.

Address of the Section: C/o Royal Society's Rooms, Institute Building, North Terrace, Adelaide.

Published Quarterly **Single Copy—NINEPENCE**

Obtainable from Cole's Book Arcade, No. 14 Rundle Street, Adelaide.

Felstead & Ormsby, Printers, Gilbert Place, Adelaide. 'Phone C. 1531

Field Naturalists' Section of the Royal Society of South Australia.

Office Bearers, 1924-25.

Chairman—Mr. E. S. Hughes.

Vice-Chairmen—Prof. T. Harvey Johnston, D.Sc., Mr. F. J. Bailey.

Hon. Secretary—Mr. E. H. Ising, Loco. Dept., Railway Station, Adelaide.

Assistant Hon. Secretary and Assistant Treasurer—Miss E. Ireland.

Hon. Treasurer—Mr. B. B. Beck, Cole's Book Arcade, Rundle Street.

Hon. Librarian—Miss I. Roberts.

Hon. Press Correspondent—Mr. D. J. McNamara.

Hon. Magazine Secretary—Miss M. Roeger.

Committee—Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Messrs. J. F. Bailey, Wm. Ham, F.R.E.S., W. H. Selway, W. J. Kimber, W. Champion Hackett, F.R.H.S., C. Pearce, A. J. Morison and J. A. Hogan, Miss Roeger, and the Chairman and Secretary of the Flora and Fauna Committee.

Hon. Auditors—Messrs. W. D. Reed, F.C.P.A., and A. J. Morison.

Fauna and Flora Protection Committee—Captain S. A. White, C.M.B.O.U., Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Prof. F. Wood Jones, D.Sc., Messrs. E. Ashby, F.L.S., M.B.O.U., W. H. Selway, J. M. Black, J. F. Bailey, A. H. Elston, F.E.S., A. M. Lea, F.E.S., F. Angel, W. Champion Hackett, F.R.H.S., B. B. Beck, J. Neil McGilp, A. J. Morison, and J. Sutton, and Mrs. W. Champion Hackett.

"The South Australian Naturalist," Editor—Mr. Wm. Ham, F.R.E.S., The University, Adelaide.

Business Committee—Miss Roeger, Mrs. Day, and Mr. J. Sutton.

FORTHCOMING EXCURSIONS.

PROGRAMME 1925.

May 23—Morialta. Native Flora. Tram 2 p.m. Leader, Prof. J. B. Cleland.

May 30—Bridgewater. Autumn foliage etc. Visit to Mr. T. C. Wollaston's garden. Train, Bridgewater 1.24 p.m.

June 8—Kinchina. Bird life and Botany. Train 7.22(altered from 7.29). Leader, Mr. J. Sutton.

June 20—Botanic Garden. Meet at entrance at 2.30 p.m. Leader, the Director, Mr. J. F. Bailey.

July 4—Fullarton. Inspection of Curios on the invitation of Dr. A. W. Hill. Tram, 2 p.m.

July 18—Museum. Meet at entrance at 2.30 p.m. Leader, the Director, Mr. Edgar R. Waite.

Aug. 1.—Enfield. Flora of original Scrub. Leader, Mr. E. H. Ising. Tram, 2 p.m.

Aug. 15—Slape's Gully. Native Flora and Bird Life. Leader, Mr. J. A. Hogan. Tram, 2 p.m., Burnside.

Aug. 29—Semaphore. Shorelife. Leader, Mr. W. J. Kimber and Mr. F. Trigg. Train, 2.5 p.m.

May 19—Mr. A. M. Lea—"Travels in the Pacific."

June 16—Dr. R. H. Pulleine—"A Further Visit to Tasmania."

July 21—Messrs. E. Macklin, B.Sc., and Featherstone, B.A.,—"A Study in Sichens." Mr. E. H. Ising—"A Botanist's Holiday at Beachport."

Aug. 18—Prof. J. A. Prescott, Waite Agricultural Research Institute, Urrbrae, Glen Osmond,—"Micro-Organisms in the Soil in Relation to Soil Fertility."

The

South Australian Naturalist.

Vol. VI ADELAIDE, MAY, 1925. No. 3

THE RIVER RED GUM, EUCALYPTUS ROSTRATA, SCHLECHT.

One of the most picturesque, widely distributed and most characteristic trees of Australia is the Red Gum of the Murray and of our Hills. All over Australia, wherever creeks wind or waters flow there stood the sturdy boles of these trees, mottled grey and green, with ragged bark, the limbs irregularly bent and twisted, often in stony ground with little soil available, gnarled and stunted yet where there was deep soil growing high and straight giving a fine trunk. The verb is used in the past tense for over great areas axe and fire have destroyed the giants of the past and, except in isolated spots and along the River, comparatively few fully-matured trees are to be seen in our State. Year by year the giants fall, their long life ended.

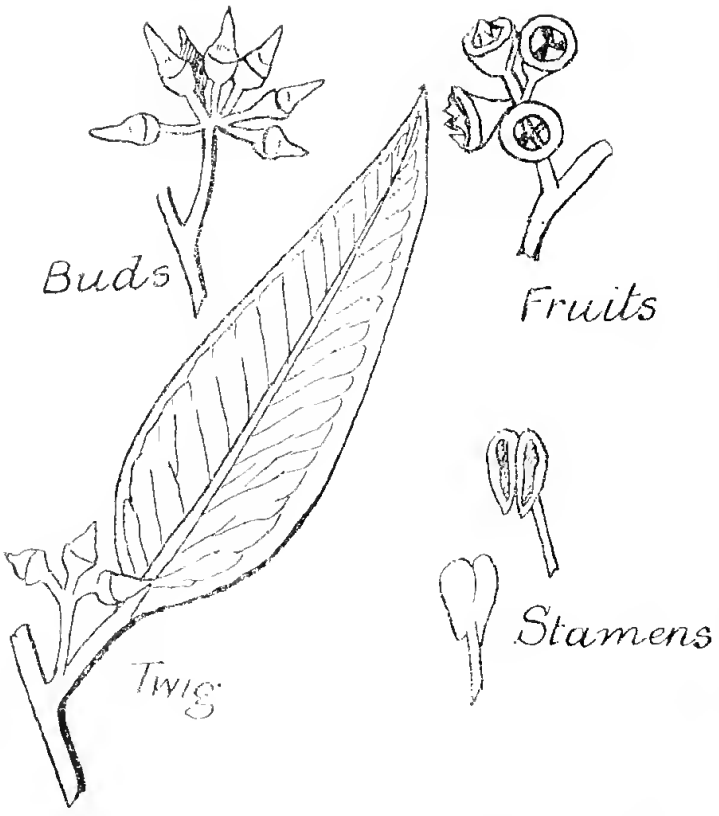
Botanical. This species was named by Schlechtendal in *Linnaea* XX, 655 (1847) from specimens from this State but whose specimens they were and where they were collected and the date I cannot learn. I have consulted Maiden's "Critical Revision of the Genus Eucalyptus" (Vol. IV, part 3, 65 (1917) and Bentham's "Flora Australiensis" III, 240, but there is no information as to the precise locality of the type. The word "rostrata" means a beak and refers to the sharply defined point of the lid or operculum which forms the calyx of the flower.

Distribution. It is found in every State of the mainland but it is remarkable that according to Baker and Smith neither this nor any other red timbered gums occur in Tasmania.

Habitat. This gum is usually found in damp situations such as the banks of creeks and rivers but also extends over hills composed of slate. It is a conspicuous feature in the drier portions of Australia growing along the watercourses which are usually dry, or have no surface water.

Timber. It is a wonderful timber, grows to a large size and is very hard, durable and heavy. The timber is put to an infinite variety of uses and where it is required for heavy work and durability it is almost unexcelled. It is used in the far interior for bush sheds, etc. and is also in prominent use in cabinet makers' work. It is used for railway sleepers, piles in piers and bridges, short beams, bed logs, mining, keelsons, paving blocks, etc.

Forestry. The tree is a quick grower and under natural regeneration it comes up very quickly. Seed remains in the ground for years. A piece of ground was shown to a party of members last month at Kuitpo which has been cropped (unsuccessfully) for a number of years, each year the gum seedlings crowding out the cereals. The trees have an established value in preventing the quick draining of heavy rains and consequent floods. Where trees abound in the watershed area they hold the rainfall in the soil in which they grow, sufficiently long to prevent flooding the creeks and rivers in their neighbourhood.



Buds, fruits and a twig of *Eucalyptus rostrata* (natural size). Stamens enlarged.

Baker and Smith, "A Research on the Eucalypts", state that in their opinion *E. rostrata* should be divided into two species differing in the chemical properties of the oils they produce. It is stated, too, that stock eat one variety and refuse the other.

MIGRATION OF WATER-BEETLES AT BROKEN HILL, NEW SOUTH WALES.

The following little history of the migratory powers of the water beetle *Eretes australis* (Erichs), forwarded by Mr. Fred. W. Shepherd of Broken Hill, may be of some interest:—

On Thursday, 30th. of April, 1925, about 9 o'clock in the evening, a friend of mine was attracted by a noise as if heavy rain or hail were falling on the roof of his house; it being a bright moonlight night, he went outside to investigate and found, as he said, countless thousands of the above beetles swarming on his roof and filling up the water spouting all round the house. He became alarmed and called on me to see if the pests were harmful; of course I allayed his fears on that score and told him how these insects flew out of the water at night time and went looking for fresh watery homes, and that evidently they had mistaken his roof for a pool of clear water. The reason I came to that conclusion was that the gentleman had just had a new iron roof placed on his house, and it shone in the moonlight like a lake of water.

H.M.H.

EXCURSION TO KINCHINA.

The special attention of members is directed to the alteration in time of starting. The train now leaves at, 7.22 not 7.29, as notified on the Programme.

NOTES ON AN AUSTRALIAN FRESH-WATER CRAB.

By Herbert M. Hale.

During a visit to Central Australia in August, 1924, Prof. Wood Jones collected living specimens of a fresh-water crab (*Geothelphusa transversa*). The crabs were at this time aestivating at the bottoms of burrows, two feet or less in depth, in the dry bed of the Finniss Creek. They were brought to Adelaide, and some of them have been maintained in aquaria for the last ten months. Two pairs were given to the writer, and these were at once installed in an observation vessel containing a mass of sand mixed with gravel, arranged in a gradual slope with the lower end leading into a small pool of water. Raw beef is supplied as food, and this is readily eaten.

For two or three days after being introduced into their new surroundings the crabs remained in the water, at the side of the aquarium nearest to a window, but later they ascended the damp sandy slope and excavated vertical or slightly oblique burrows. The pair of large, curved chelae are used for digging, the sand being scraped together in a roughly spherical mass. As each little heap is compacted it is lifted with the fore-limbs and deposited at the mouth of the burrow; the masses are arranged around the entrance so as to form a low chimney or crater, the interior of which is smoothed by the crustacean with the outside of the chelae. The finger and thumb action of the chelae is used in feeding but not in excavating.

It has been mentioned that pebbles were placed in the sand in the aquarium, and naturally the crabs occasionally met with these as their shafts deepened. If small enough to be manipulated, a stone was carried up the burrow and deposited at the mouth, but if a large pebble were encountered, the burrow was continued at an angle so as to avoid the obstruction. One crab, which was excavating an oblique shaft, experienced difficulty in persuading a pebble to sit at the entrance; after the stone had once or twice rolled down the hole again, the crab held it in position by resting one cheliped against it, and pushed sand beneath it with the other chelae. Excepting in the case of a specimen which had lost a cheliped, each individual excavated a separate burrow; the damaged individual afterwards shared the burrow of one of the others.

In March of this year two of the crabs—a male and a female—moulted, and are now slightly larger than when received; at this time the other pair died.

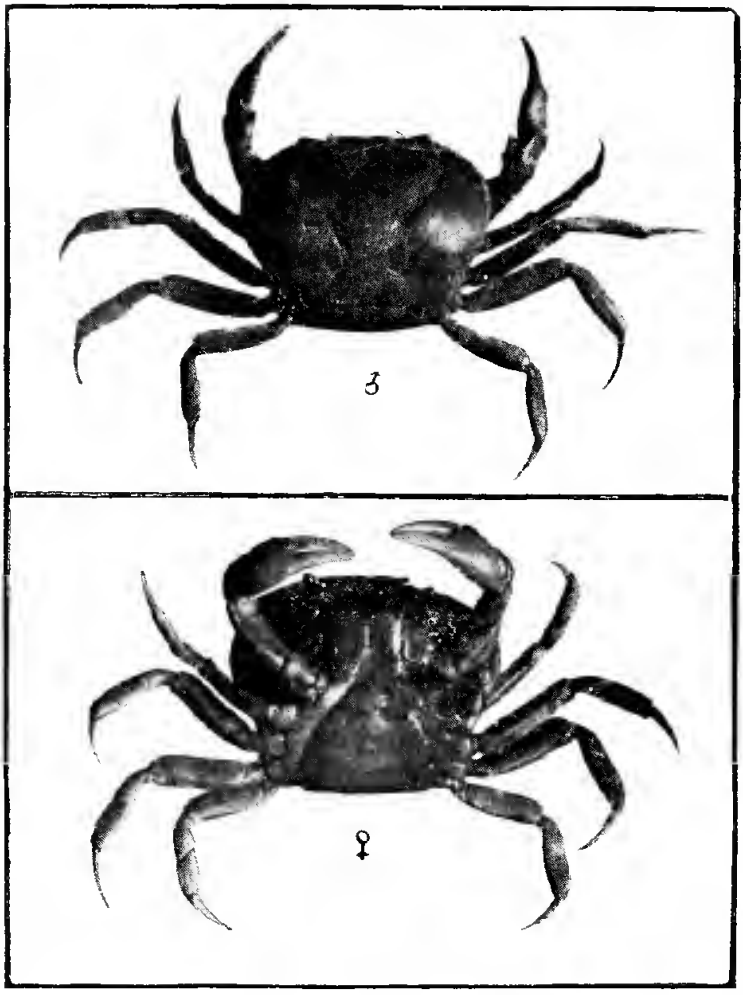


Plate 1.

Australian Fresh-water Crab (Geothelphusa transvera) male and female.

NOTE: Page 46, heading omitted, "The Plants of the Encounter Bay District" concluded from February number).

Other specimens were kept under observation by Prof. Wood Jones for some months; they were placed in an artificially heated laboratory and here kept consistently to the side of the vessel nearest to the heater. This series was fed upon earthworms (which were reduced to short lengths with the chelae before being masticated) and upon blowflies.

EXCURSION TO SEACLIFFE, MARCH 28, 1925

A large party of members, under the leadership of Mr. G. Beck, travelled to Marino Rocks and walked down to the sea-coast. At this time of the the year very few plants were found in flower but the party examined the rocks at Marino and listened to a short address by Mr. Ham, who spoke on the gradual wearing away of the coast and the formation of the plane of marine denudation on which the party was standing. A study of the many cracks in the rocks, filled with various materials among which Calcite and Quartz were the most abundant, led to the subject of faults and the formation of metalliferous lodes. Other physiographical features were dealt with as the party made their way to Marino station, where they were hospitably entertained by Mr. G. Beck.

BOTANICAL NOTES.

By Ernest H. Ising.

Loranthus pendulas, Sieb.

In the February issue of this Journal (1) I placed on record the occurence of the above species of mistletoe on *Eucalyptus obliqua* at Mt. Lofty. As Blakely does not mention this host for *L. pendulus* in his work on "The Lorauthaceae of Australia." (2) I believe this is the first record in Australia of the white stringy bark being host to the drooping mistletoe.

I am now able to record a further new host (for South Australia) for this species in that I have obtained (through the kindness of Mr. A. E. Fairhall) specimens from the brown stringybark, *Eucalyptus capitellata*, at Mt. Lofty. The inflorescence of these specimens is similar to that described by me in this Journal (l.c.) earlier in the year, viz., Flowers four in the cymule generally, three flowers in a straight row, the central one sessile, with one lateral pedicellate flower.

(1) Vol VI, 31 (1925).

(2) Proc. Linn. Soc. N.S.W., Vol. XLVII, part 4, 409c (1922).

GERANIACEAE.—Geranium pilosum, Forst; *G. pilosum* var. *potentilloides*, Benth (var. *australe*, Ostenf.); **Erodium botrys*, (Cav.) Bertol; **Erodium moschatum*, (L.) L'Her; *Pelargonium australe*, Willd, along the coast; *P. australe* var. *crodioides*, Benth.; **P. graveolens* (Thumb), L'Her, near Victor Harbour; *Oxalis corniculata*, L.; **O. cernua*, Thumb., Soursob.

LINACEAE.—Linum marginale, A. Cunn.; **L. gallicum*, L., in pastures.

ZYGOPHYLLACEAE.—Zygophyllum Billardieri, DC., Pt. Elliot; *Nitraria Schoberi*, L., Nitre-bush, on the Bluff near the sea.

RUTACEAE.—[*Zieria veronicea*, F.v.M., on the Currency Creek side of Ashbourne]; *Boronia filifolia*, F.v.M., in the scrub between Rosetta Head and Waitpinga; *B. palustris*, Maid. et. Black (with petals as long as sepals but only four stamens) in swamp on Yankalilla side of S. of Mt. Hayfield, Tunkalilla Rd., and in Back Valley; *Correa aemula* (Lindl), F.v.M., several shrubs are growing amongst the rocks at the Upper Waterfall, Hindmarsh River, Jan., Sep.; *C. alba*, Andr., on the cliffs at King's Point; *C. rubra*, Sm., scattered through the low scrub, Jan., Sep.; *C. rubra* var. *glabra*, Benth., on the top edges of the cliffs beyond the Bluff as a nearly prostrate undershrub, Sep.; *C. reflexa*, Labill., a tall shrub in a watercourse at Waitpinga and in a ravine at Tunkalilla Beach, about 3 feet high, Jan.; *Phebalium brachyphyllum*, Benth., recorded in Fl. Austr. for Encounter B.

TREMANDRACEAE:— Tetratheca pilosa, Labill., Upper Hindmarsh Valley.

POLYGALACEAE:—Comesperma calymega, Labill.; *C. polygaloides*, F.v.M., both in the Waitpinga scrub.

EUPHORBIACEAE.—Phyllanthus australis, Hook., N. of Rosetta Head, Jan., Nov.; *Adriana Klotzschii*, (F.v.M.) Muell. Arg., in sandy soil near the sea; *Euphorbia Drummondii*, Boiss.; **E. peplus*, L.; *Poranthera microphylla*, Brongn.; *P. ericoides*, Klotzsch, in sand; *Beyeria Leschenaultii*, (DC.) Benth.; *Micrantheum Tatei*, (F.v.M.) J. M. Black; *Pseudanthus micranthus*, Benth., recorded in Black's Flora for near Encounter B.

STACKHOUSIACEAE.—Stackhousia monogyna, Labill., Upper Hindmarsh Valley.

SAPINDACEAE:—Dodonaea viscosa, L.; *D. attenuata*, A. Cunn.

RHAMNACEAE:—Pomaderris obcordata, Fenzl., in nearly dry swampy ground, Aug.; *P. racemosa*, Hook.; *Cryptandra leucophracta*, Schlecht.; *C. hispidula*, Reiss.; *Spyridium coactilifolium*, Reiss.; *S. thymifolium*, Reiss., about 2 ft. high, much branched.

MALVACEAE.—Plagianthus spicatus, Benth., under *Melaleuca halmaturorum* on the banks of the Inman R. near its mouth, Jan.; **Malva parviflora*, L.; **M. aicaensis*, All.: *Lavatera plebeja* Sims, Sep.; **L. arborea*, L., Tree Mallow, Victor Harbour, Jan.: **Pavonia hastata*, Cav., roadside, Victor Harbour.

STERCULIACEAE.—Thomasia petalocalyx, F.v.M., Waitpinga, Inman Valley; *Lasiopetalum Baueri*, Steetz.

DILLENIACEAE.—Hibbertia sericea, Benth., in nearly pure sand, Jan.; *H. stricta*, R.Br., var., *glabriuscula*, Benth. (also a form slightly pedicellate); *H. acicularis*, F.v.M., var. *sessiliflora*, J. M. Black; *H. virgata*, R.Br., in sand.

GUTTIFERAE.—Hypericum japonicum, Thun.

FRANKENIACEAE.—Frankenia pauciflora, DC., salt marshes.

VIOLACEAE.—Viola betoniaefolia, Smith, hills of the Upper Hindmarsh, stoloniferous.

THYMELAEACEAE.—Pimelea phylicoides, Meisn.; *P. octophylla*, R.Br.; *P. glauca*, R.Br.; *P. serpyllifolia*, R.Br.

LYTHRACEAE.—Lythrum hyssopifolia, L., Loosestrife.

MYRTACEAE.—Calythrix tetragona, Lab.; *Lhotzkya glaberrima*, F.v.M., near Newland's Head (recorded in Tate for Kangaroo Island only); *Baeckea diffusa*, Sieb.; *B. crassifolia*, Lindl. (with linear leaves); *Leptospermum scoparium*, F.v.M.; *L. pubescens*, Lam., along creeks; *L. myrsinoides*, Schlecht., in sand; *Kunzea pomifera*, F.v.M., creeping, in sand; *Callistemon coccineus*, F.v.M., in swampy soil usually; *Melaleuca decussata*, R.Br., very common; *M. parviflora*, Lindl., Waitpinga on limestone, [Normanville]; *M. uncinata*, R.Br., occasional plants behind Encounter Bay; *M. halmaturorum*, F.v.M., Paper-bark Tea-tree, Inman and Hindmarsh Rs., near salt water; *Eucalyptus angulosa*, Schau. (*E. incrassata*, Labill., var. *angulosa*, Benth.), mallee, in sand and sandy loam, flowering in Jan. and Feb., Waitpinga scrub; *E. conglobata* R.Br., mallee, in similar situations; *E. conglobata*, R.Br., var. *anceps*, Maid., Waitpinga scrub; *E. calycogona*, Turcz., mallee, Waitpinga scrub; *E. odorata*, F.v.M., var. *cajuputea*, F.v.M., forming small thickets in sandy loam at the top of the hill at the commencement of the Waitpinga Rd., and at the entrance to the Lindsay's home at Victor Harbour; *E. obliqua*, L'Her., Hindmarsh Tiers, used for milling, and in the deep gullies of the Tunkalilla district, here appearing also as low shrubs, mallee-like, near the sea and on top of the ranges; *E. leu-*

coxylon, F.v.M., 'Blue Gum', common on grassy land and in the valleys, often forming large trees, the deep pink-flowering forms common, Jan.; *E. leptophylla*, Mig., 'March Gum' because said to flower in this month, but flowering abundantly in mallee formation, even when only 3 or 4 ft. high, in January and February, very pretty and dainty with bright yellowish-green narrow leaves, in sandy loam, Waitpinga scrub and on slopes not far from the sea east of Kalawonda Creek and near Hall's Creek; *E. cneorifolia*, DC., the Kangaroo Island oil-mallee, recorded only for Kangaroo Island in Maiden's Critical Revision of the Genus Eucalyptus, but the Port Lincoln district is given also in Tate's Flora of S. Australia on Mueller's authority (perhaps in error), one clump in Waitpinga scrub on the Bluff side, odd clumps said by residents to occur in a straight line over a number of miles farther west; *E. viminalis*, Lab., Manna Gum, in the gullies, Hindmarsh Valley, Hall's Creek, Waitpinga, etc.; *E. rostrata*, Schl., Red Gum, near watercourses, Inman and Hindmarsh Rs., thickets at Victor Harbour; *E. cosmophylla*, F.v.M., very common, mallee-like to small trees, capsules often very large, in sand or sandy loam; *E. Blaxlandii*, Maiden (*E. capitellata, sens. lat.*) in sand or sandy loam, often with a mallee-like habit in the former and 2 or 3ft. high to tall shrubs, in better soil as spreading small trees, often flowering (Jan.) when only a few feet high, Waitpinga scrub, tops of ridges between Waitpinga and Tunkalilla Rd., Hindmarsh Tiers; *E. Muelleriana*, Howitt, Hindmarsh Tiers, Tunkalilla Rd., shrubby or small tree, stringy bark; *E. diversifolia*, Bonpland, low mallee-like shrub, very common in sand and sandy loam, Waitpinga scrub and scrub near Rosetta Head, forming a dense intricate growth near the sea at Waitpinga; *E. fasciculosa*, F.v.M., Pink Gum, very common, on firmer soils, shrubs to small trees, flowering (Jan.) when small; *E. ovata*, Labill., near watercourses, often large trees, Hindmarsh Tiers, Back Valley, Hall's Creek, water courses in Tunkalilla district.

OENOTHERACEAE.—**Oenothera odorata*, Jacq., Evening Primrose, sandhills; **Oe. longiflora*, Jacq., sandhills at Encounter B.

HALORRHAGIDACEAE. — *Halorrhagis* (*Meionectes*) *Brownii*, (Hook. f.) Schindler, in swamps, Upper Hindmarsh Valley, Jan.; *H. digyna*, Labill.; *H. tetragyna*, R.Br.; *H. teucrioides*, Gray; *Myriophyllum intermedium*, DC., Upper Hindmarsh Valley.

UMBELLIFERAE.— *Hydrocotyle Asiatica*, L. Inman Valley, Jan.; *H. hirta*, R. Br., in a swamp, Upper Hindmarsh Valley; *H. callicarpa*, Bunge, Nov.; *Trachymene heterophylla*, F. v. M., in low scrub, Jan.; *Xanthosia pusilla*, Bunge, in sandy

soil, Nov.; **Foeniculum vulgare*, Mill., Fennel; *Apium australe*, Thou., near the sea, Hall's Creek; **A. graveolens*, L., Wild Celery, Hall's Creek; *Sium latifolium*, L.; *Daucus brachiatus*, Sieb., Nov.; *Eryngium vesiculosum*, Labill., between Myponga and Hindmarsh Tiers.

EPACRIDACEAE:—*Brachyloma ericoides*, Sond., Jan.; *Astroloma conostephoides*, (Sond.) F.v.M.; *A. humifusum*, (Cav.) R.Br. this occurs in three forms, dark and light coloured relatively broad-leaved forms flowering in January (var. *denticulatum*, (R.Br.) J. M. Black), and the type with much narrower leaves not flowering in January, all growing near each other; *Leucopogon Richei*, Lab., amongst rocks at the Upper Waterfall, Hindmarsh R., and on sandhills at Encounter B.; *L. concurvus*, F.v.M.; *L. virgatus*, Labill., in sand, Jan.; Nov.; *L. hirtellus*, F.v.M., Aug.; *L. rufus*, F.v.M., near the Inman R.; *L. hirsutus*, Sond., in swamps, Back Valley; *Acrotriche serrulata*, Labill.; *Epacris impressa*, Labill., Upper Hindmarsh Valley, Tunkalilla hills; *Sprengelia incarnata*, Smith, swamp on Yankalilla side of S. of Mt. Hayfield on Tunkalilla Rd. and in Back Valley.

PRIMULACEAE:— *Samolus repens*, Pers.; **Anagallis arvensis*, L., Pimpernel (with red flowers); **A. femina*, Mill. (blue flowers).

OLEACEAE:—**Olea europaea*, L., Olive, distributed by starlings and found in the sandhills at Encounter B.

LOGANIACEAE:—*Logania linifolia*, Schl.; *L. ovata*, R.Br., on limestone, Pt. Elliot.

GENTIANACEAE:—*Sebaea ovata*, R.Br.; **Erythrea Centaurium*, Pers.; *Limnanthemum reniforme*, R.Br., in swamps.

APOCYNACEAE:—**Vinca major*, L. Periwinkle, a garden escape.

ASCLEPIADACEAE:—**Gomphocarpus arborescens*, R.Br., Waitpinga Rd.

CONVOLVULACEAE:— *Convolvulus erubescens*, Sims; *Dichondra repens*, Forst.; *Wilsonia rotundifolia*, Hook., in dry swamp land behind the sand hills.

BORRAGINACEAE:—*Heliotropum curassavicum*, L. on dry swamps; *Cynoglossum suaveolens*, R.Br.; *C. australe*, R.Br., on flats behind Encounter B., **Lithospernum arvense*, L., Corn Cromwell.

LABIATAE:—*Lycopus australis*, (R.Br.), Upper Waterfall, Hindmarsh R.; *Mentha gracilis*, R.Br., 12 ins. high, Back Valley; **M. spicta*, Huds., Spear Mint, Hindmarsh Valley; **M. Pulegium*, L., Pennyroyal, Inman Valley; **Lavendula Stoechas*, L., French Lavender, near the Inman R.; **Marrubium vulgare*, L., Horehound; **Salvia verbenaca*, L., Wild Sage; *Scutellaria humilis*, R. Br.; *Prostanthera microphylla*, A. Cunn., Nov., scrub behind Rosetta Head; **Stackys arvensis*, L.

SOLANACEAE:—**Solanum sodomaeum*, L. Apple of Sodom; **S. opacum*, A.Br.; **S.* sp. probably a form of *S. pterocaulon*, Dun.; **Lycium ferocissimum*, Miers, Boxthorn; **Datura Stramonium*, L., Thorn Apple; *Nicotiana suaveolens*; **N. glauca*, Grah. Tobacco Tree.

SCROPHULARIACEAE:—*Mimulus repens*, R.Br., on the edge of the swamps; *Euphrasia collina*, R.Br., Sep.; *Gratiola peruviana*, L.; **Linaria Elatine*, Mill., Pointed Toadflax; **Verbascum virgatum*, With.; *Veronica distans*, R.Br. on the sandhills; **Bartsia latifolia*, Sibth.

LENTIBULARIACEAE:—*Utricularia dichotoma*, Labill., in creeks west of Waitpinga and in Back Valley; *U. lateriflora*, R.Br., in swamp in Back Valley off Inman Valley.

MYOPORACEAE:—*Myoporum insulare*, R.Br.; *M. viscosum*, R.Br., along dry watercourses.

PLANTAGINACEAE:—*Plantago varia*, R.Br.; **P. lanceolata*, L., Rib-grass; **P. Coronopus*, L., Buck's-horn Plantain, sandy soil near the sea.

RUBIACEAE:—*Opercularia varia*, J. Hook., Victor Harbour, Hindmarsh Valley; **Sherardia arvensis*, L., Field Madder; *Galium Gaudichaudii*, DC.; **G. murale*, All.; *G. umbrosum*, Sol.

AMBROSIACEAE:—**Xanthium spinosum*, L., Bathurst Burr.

DIPSACEAE:—*Scabiosa maritima*, L., on the sandhills at Encounter B., etc.

CUCURBITACEAE:—**Cucumis myriocarpus*, Naud., Wild Melon, on the Bluff.

CACTACEAE:—**Opuntia monocantha*, Haw., Prickly Pear.

CAMPANULACEAE:—*Lobelia rhombifolia*, De Vriese; *L. gibbosa*, Labill; *L. anceps*, Thumb; *Wahlenbergia gracilis*, DC.

GOODENIACEAE:—*Dampiera rosmarinifolia*, Schlecht; *Velleya paradoxa*, R.Br., on the Bluff; *Selliera radicans*, Cav.; *Scaevola crassifolia*, Lab.; *S. microcarpa*, Cav.; *S. linearis*, R.Br.; *Goodenia amplexans*, F.v.M., on and near the Bluff, Victor Harbour; *G. ovata*, Smith; *G. geniculata*, R.Br.

BRUNONIACEAE:—*Brunonia australis*, Smith.

STYLIDIACEAE:—*Stylidium graminifolium*, Swartz; *S. calcaratum*, R.Br., Nov.; *Levenhookia Sonderi*, F.v.M., Nov.

COMPOSITAE:—*Olearia pannosa*, Hook, Waitpinga Scrub, Nov.; *O. ciliata*, F.v.M., Tunkalilla, Jan.; *Olearia axillaris*, F.v.M., sandhills near the sea; *O. ramulosa*, Lab., near the sea, also a form with the ligule narrow but twice as long as the style at Victor Harbour; *O. ramulosa*, var. *microphylla*, Benth., scattered through the scrub, decidedly sticky; *O. lepidophylla*, Pers., flowers violet, very pretty undershrub, scrub behind the Bluff, Jan.;

O. glandulosa, Benth., Hindmarsh Tiers; *Vittadinia australis,* Rich.; *V. australis,* var. *tenuissima,* Benth.; *L agenophora emphysopus,* Hook. f., in cropped grass land near the Bluff; *Bracycome ciliaris,* Less., on the sandhills near the sea, Jan.; *B.collina,* Benth.; *Cymbonotus Lawsonianus,* Gaudich., Jan.; *Erechtites prenanthoides,* DC., var. *picridioides,* Benth., Jan.; *E. arguta,* DC., Jan.; *E. quadridentata,* DC.; *Senecio lautus,* Sol., Jan., Aug., Sep.; *S. odoratus,* Horn., var. *obtusifolius,* J. M. Black, on cliffs near the sea, Jan.; *Cotula coronopifolia,* L., in swampy ground, Jan.; *C. australis,* Hook., Hindmarsh Valley, Jan.; *Centipeda Cunninghamii,* F.v.M., in dry swamps, Jan.; *Ixodia achilleoides,* R.Br.; *Rutidosis pumilo,* Benth., Nov.; *Ixiolaena supina,* F.v.M., on sea-cliffs, Jan.; *Cassinia aculeata,* R.Br., leaves over 1 in. long, Jan.; *C. spectabilis,* R.Br., Waitpinga, sandy scrub near Hall's Creek; *Gnaphalium luteoalbum,* L., Jan.; *G. japonicum,* Thunb. Jan.; *Leptorhynchos squamatus,* Less., Jan.; *Helipterum exiguum,* F.v. M., Nov.; *Helichrysum scorpioides,* Lab., Jan.; *H. rutidolepis,* DC., Jan.; *H. lucidum,* Henck.; *H. obtusifolium,* Son. et F.v.M., Jan., Nov.; *H. cinereum,* F.v.M.; *H. Blandowskianum,* Steetz, Jan.; *H. leucopsidium,* DC.; *H. Baxteri,* F.v.M., Nov.; *H. apiculatum,* DC., leaves very narrow inland to 2 cm. broad on the sea-cliffs; *Calocephalus Brownii,* F.v.M., sea-cliffs, Jan.; *C. citreus,* Less., Jan.; *Microseris scapigera,* (Forst.) Sch. Bip., Aug., Sep.

INTRODUCED COMPOSITAE:— **Erigeron linifolius,* Willd.; **Inula graveolens,* Desf., Stinkwort; **Crypostemma calendulaceum,* R.Br., Cape Dandelion; **Silybum Marianum,* Gaertn., Milk Thistle; **Cynara Cardunculus,* L., Wild Artichoke, Pt. Elliot; **Cirsium lanceolatum,* Scop., Spear Thistle; **Centaurea melitensis,* L., Maltese Cockspur; **C. calcitrapa,* L., Star Thistle; **Cichorium Intybus,* L., Chicory; **Hypochaeris radicata,* L., Rooted Cat's-ear; **Picris hieracioides,* L., var. *squarrosa,* Benth., along the coast; **Tragopogon porrifolius,* L., Salsify.; **Lactuca saligna,* L., Willow Lettuce; **Sonchus oleraceus,* L., Common Sow-Thistle; *S. asper,* Hill, var. *littoralis,* J. M. Black, probably an endemic Australian form, near the sea, Jan.

CYPERACEAE.—Lepidosperma carphoides, F.v.M.

HERBARIUM.

We gratefully acknowledge the receipt of further specimens of plants, mosses, fungi, etc., collected by the late Mr. J. G. O. Tepper. These have come to us through Mr. Tepper of Perth and Mrs. Cowan of Norwood. The specimens will be housed with other specimens in the Tepper Memorial Herbarium.

A collection made by Messrs. B. B. Beck and S. Stokes at Wilpena Pound in September and October, 1924, have been forwarded. Mr. J. M. Black has kindly identified the specimens,

numbering about 100. Two specimens of *Hybanthus Tatei*, F.v.M., were collected and are included. Only 3 or 4 specimens are known to have been recorded. The plant itself is only known to grow in this district.

Additions to our Library since last issue of the "Naturalist."

Mr. W. W. Froggatt, F.L.S., Government Entomologist of New South Wales has kindly forwarded copies of his various works on Scale insects and other pests. Mr. Froggatt is well known as the Australian authority in this branch of entomology. The works comprise the following:—

1. "Official Report on Fruit Fly and other Pests in Various Countries."
2. "A Descriptive Catalogue of the Scale Insects (Coccidae) of Australia."
3. Notes on the Apple Root Weevil.
4. The Blue Oat Mite
5. The Buff-Coloured Tomato Weevil.
5. The Kangaroo Bot Fly.
7. The Apple-Leaf Jassid.
8. Orchard and Garden Mites.
9. The Peach Tip Moth.
10. Leaf Galls of Phylloxera
11. The Shothole Borer.
12. Blister Mites.
13. The Grass Root Beetle.
14. The Banana Aphis
15. Insects Infesting Woollen Tops.
16. Climbing Cutworms.
17. The Yellow-Barred Grass Moth.
18. Insects which damage Saltbush.
19. The Lantana Fly.
20. The Sheep Maggot Fly and its Parasite.
21. Cicadas as Pests.
22. The Digger Chalcid Parasite.
23. The Diamond-backed Cabbage Moth.
24. The Powderpost Beetle and its Parasite.
25. A New Mealy Bug on Citrus Trees.
26. A Garden Fly Maggot.
27. The Domestic Rats.
28. The Banded Pumpkin Beetle.
29. The Mediterranean Flour Moth.
30. A New Mealy Bug on Citrus Trees.
31. Experimental Work with the Peach Aphis.
32. Forest Longicorn Beetles and their Parasites.
33. Insects and Prickly Pears.

LECTURE ON "A TRIP TO WILPENA POUND," BY MR. H. M. HALE, APRIL 21, 1925.

Mr. H. M. Hale gave a lecture on the evening of April 21 dealing with a recent excursion to Wilpena Pound by four members (Messrs. Beck, Stokes, Wilkinson and Hale). A series of excellent lantern slides, dealing with the trip, added interest to the narrative. Reference was made to previous excursions to Mooloolloo and the Owienagin Pound and the hospitality of Mr. and Mrs. Lindo, of Mooloolloo. Using a map, the lecturer directed attention to the mountain range extending from the neighbourhood of Kangaroo Island to Lake Eyre, and variously designated the Mount Lofty Ranges, Barossa Range, and Flinders Range. From Quorn northwards this range provided some of the most striking scenery in the State, including the beautiful Owienagin Pound. Two months of last year were spent in these ranges by Mr. Tindale and the lecturer. The North Flinders Range included what Professor Howchin had described as "the roughest and most inaccessible portions of the highland of South Australia." The ranges are divided into a series of parallel ridges. West of Hawker was the Yappala Range, and to the north the Elder Range, which contained that wonderful natural amphitheatre known as the Wilpena Pound. The pounds, relatively flat areas ringed in by precipitous hills, formed quite a feature of the ranges.

The Wilpena Pound possessed several remarkable features. It was almost inaccessible, entrance being practicable only on foot or, at best, on horseback. St. Mary's Peak, on the enclosing rim, was approximately 3,900 ft. in height, the highest point in the settled part of S.A. The annual rainfall sometimes amounted to 26 in., while outside the pound it rarely exceeded 10 in. It was considered to be the coldest spot in the State. Snow often remained on St. Mary's Peak for a week at a time.

Upon arrival at Hawker the party of naturalists met Mr. Bartholomaeus, the owner of Arkaba Station, situated in the ranges 15 miles from the town. At Arkaba they enjoyed large-hearted hospitality over a week-end. Some years ago it was said Arkaba was offered for £250 without eliciting a bid. Now it is estimated to be worth £32,000. As showing the ravages of wild dogs, it was mentioned that one dog, which got over the carefully constructed fence accounted in a short time for a loss of sheep estimated as worth £200, and £40 was offered for his scalp. The usual beast of burden there was the donkey. Thirty or forty donkeys were harnessed to a wagon load of wood to convey it to Hawker, 35 miles distant.

Among the natural history specimens in the district was a peculiar species of grasshopper, in form and colour strongly resembly a gum leaf. The watercourses, which were wide and deep, became, in seasons of heavy rain, raging torrents. It was noted that the gumtrees were blackened on the up-stream side only. That was explained as having been caused by the burning of debris which had been heaped up on that side by the floods. In a cave they found a pair of bats, which were afflicted with rare parasites. At the Arkaba Asbestos Mine the party were shown some excellent native asbestos, but the mine had to be abandoned some excellent native asbestos, but the mine had to be abandoned.

Mr. Bartholomaeus drove the party to Wilpena Pound, now owned by Mr. Hunt. Beautiful green grass, huge gums, graceful pines, and a permanent running stream combine to make this station one of the most beautiful places in the State. Mrs Hunt had an excellent garden, and grew vegetables. The huts and sheds were built of northern pine, which like the tea tree, defied attack by white ants. South of the camp there was an imposing point, Rawling's Peak. At the bottom of the entrance gully was a large swamp surrounded with luxurious grass. The euros grazed there, but cattle did not thrive on it. From the camp a picture was taken of enchanting scenery. The track, shaded by stately red gums, wandered alongside a permanent stream, which farther on, widened, and resembled a miniature lake. The actual entrance to the pound was a narrow bottleneck, with on one side precipitous hills, and on the other sloping rock, with the creek at the bottom. Previous to 1914 the place was leased to a farmer, who put in an enormous amount of work in making a metal road, which had since been wiped out by the floods. Just within the pound a serious of rocky terraces of a beautiful pink colour ran transversely across the creek. The party dubbed them the "Pink Terraces." Mr. Hunt hoped to introduce trout into the pools, which seemed admirably adapted for that purpose. The road along the bank was bordered with moss 15 ft. deep. At the time of the visit the moss was afire in places, and if any one stepped there he would have sunk several feet into the hidden smouldering ashes. Half a mile along the track the homestead constructed by the farmer previously mentioned came into view. It was a substantially-built stone house, surrounded by an orchard and with stables, cowsheds, and piggeries. All the building material had to be conveyed from Hawker, and nearly all the labour was done by his own hands. In a dry season a prolific crop of wheat could be raised inside the pound, but in a normal season such grain perished from excess of moisture. The interior of the pound

was in places covered with dense growths of red gum, northern pine, mallee, and sheoak. The trees grew in defined belts containing only one species. Birds were not plentiful. Opposite the entrance to the pound was a peak known as Fred's Nob, from which there was a terrific drop to the outside. Wildflowers were abundant and fine, especially the white Grevillea. Xanthorrhea also grew to perfection. A species of wattle was in bloom at the time of the visit, and was greatly admired. The great ambition of the patry to stand on the highest point in the Flinders Range could not be accomplished until the end of the trip, when an arduous and laborious climb was crowned by success, and the wearied tourists reclined against the trigonometrical cairn that marks the summit.

Mr. J. M. Black spoke about some of the botanical specimens collected on the trip. They included the Desert Rose, the Hibiscus, and Hybanthus Tatei, of which there are only two specimens in Adelaide, one in Melbourne and one at Kew. The Pimelea Petrophila is found only in the Flinders Range.

EXCURSION TO KUITPO FOREST, 28th APRIL, 1925.

A party of members visited the Kuitpo Forest under the direction of Mr. H. H. Corbin, B.Sc., who controls the forest. The forester in charge, Mr. Durward, met the party and provided facilities for having morning tea. The buildings comprise huts built of local timber which are used by parties of boys studying forestry who receive a ten days' course under practical conditions. The boys come from all the schools and colleges of the city and they always wish to return for further training but this cannot be done, as facilities are not provided for an unlimited number. The nursery was interesting, as showing the treatment of pine seedlings. Experiments in dealing with the transplants led to healthier plants and consequent smaller proportion of loss. Close by the nursery a bare area was planted with 6 varieties of wattles and several gums, and this has provided a delightful little patch, the wattles producing flowers at various times of the year. A tremendous amount of experimental work is being carried on; requests for information and seeds come from all parts of the world. China has recently asked for seeds of trees that would grow in salt water. By planting different species in various situations, knowledge is soon gained as to the best habitats for certain trees. Good object lessons are to be had where one species has been planted in many different situations; sometimes the hilltops are favored and sometimes the flats or gentle slopes. One of the most important facts are that some Australian trees, e.g., ironbark and sugar gum (two excellent timber trees)

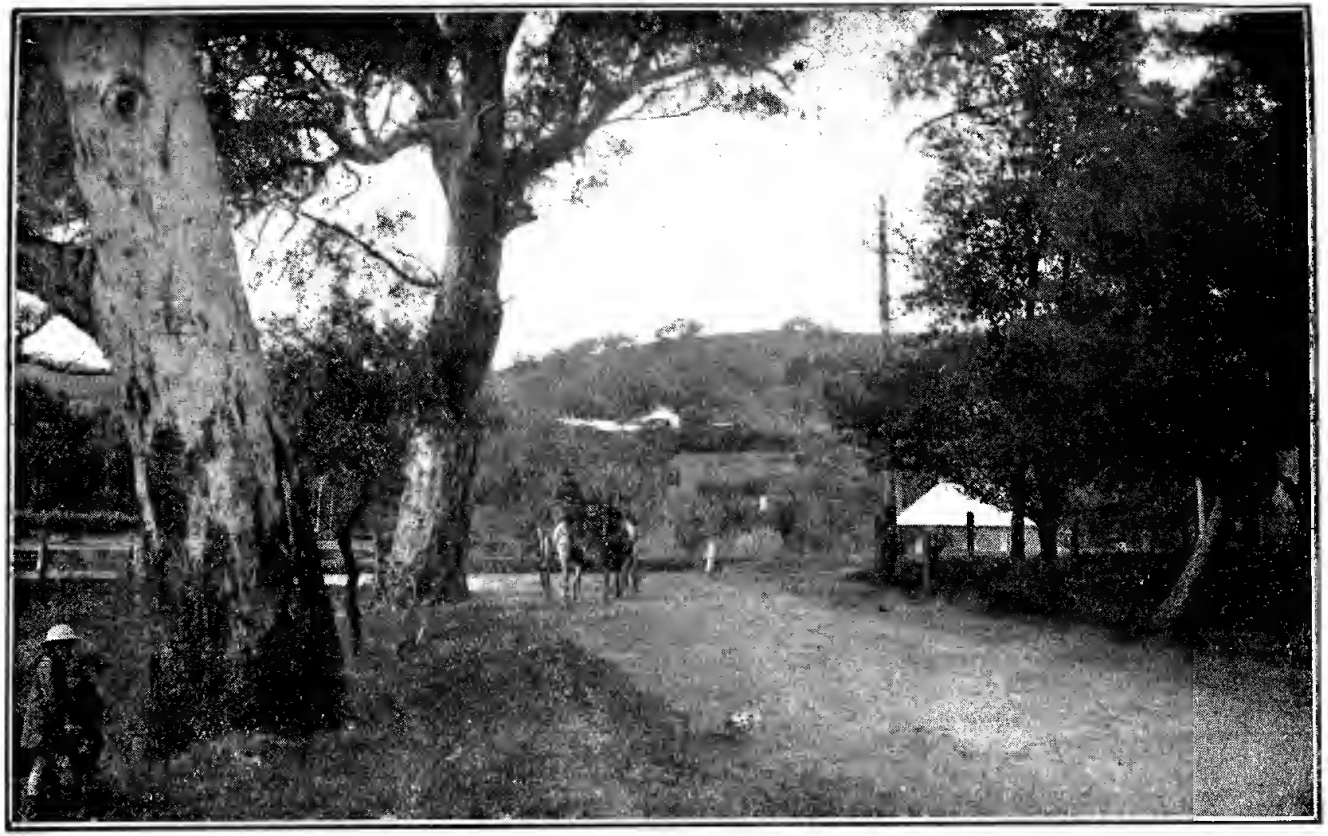
grow on poor soils and pay handsomely. Where agricultural operations are impossible and crops will not grow, forestry is a pronounced success. In this connection *Pinus laricio* is bound to play an important part in our forestry operations as it will do well in poor soils on hilltops, and produce a high grade white deal. It was due to the observations and experiments at Kuitpo that new crops of tanning bark (from *Acacia pycnantha*) can be produced in two years as compared with 7 years. By cutting the tree off at ground level after stripping, new shoots spring up, which are again ready for the stripper in two years. This should prove of immense benefit to wattle growers and to the State in general. Where one stem grew on the original plant several spring up to take its place thus doubling or trebling the value of the plant. Where a strip of scrub land is wanted for putting under forestry conditions an area is clear felled, an outside mill does the cutting, and quite a trade in firewood has sprung up. Contrary to the general opinion, forestry operations bring in a good revenue in 10 years, from the thinning out of small trees which (at Kuitpo) find a ready sale. By this means the original cost of planting is repaid leaving the majority of the trees, which are good sound timber, as clear profit to the grower. Small plantations of pines or Australian trees will pay handsomely in the lifetime of the planter who is not more than middle-aged. Private enterprise can do much to stave off the timber famine which is fast approaching and will be severely felt in Australia as well as the whole world. It is a distinct education to be conducted through the forest by Mr. Corbin who has an illimitable supply of information concerning growing trees and Kuitpo Forest.

—o—

MOUNT LOFTY FOREST.

All lovers of nature should be interested in the efforts of the Section to have the area north-west of the summit reserved by the government as a national park and forest reserve. This land is beautifully situated and covered with a flourishing growth of young stringy bark trees.

Its nearness to the city and its availability by good roads are among the many reasons making it a desirable acquisition before it is too late, and the land cuit up into building blocks.



RED GUMS AT MITCHAM.
(Block kindly lent by courtesy of the S.A. Government Tourist Bureau.)
Two Red Gums are shown in the left foreground. The character of the bark is clearly shown.

MALACOLOGICAL SECTION.

In answer to repeated requests, Mr. Kimber has expressed his willingness to meet a number of members who are desirous of studying the shells and the life history of the animals that make them. Will members who are desirous of forming such a circle communicate with Mr. Kimber, at Joslin, 'phone Norwood 1114.

AUSTRALIAN BOTANICAL NOMENCLATURE.

At a meeting of the Botanical Section of the Australian Association for the Advancement of Science, held in Adelaide in August of last year, it was resolved to appoint a committee to draw up recommendations for stabilising the nomenclature of Australian plants, the recommendations to be submitted to the international Botanical Congress to be held at Ithaca, N.Y., U.S.A. in June, 1926. This is the first international congress convened since that which met at Brussels in 1910. The Committee was composed of the following members:—

New South Wales—Professor A. Anstruther Lawson, D.Sc., Department of Botany, University of Sydney; Dr. G. P. Darnell-Smith, Government Botanist; Mr. Edwin Cheel, Curator New South Wales National Herbarium; Mr. J. H. Maiden, I.S.O., F.R.S., F.L.S., late Government Botanist.

Victoria—Professor A. J. Ewart, D.Sc., F.R.S., F.L.S., Department of Botany, University of Melbourne; Mr. William Laidlaw, Government Botanist; Mr. J. W. Audas, F.L.S., Curator Victorian National Herbarium.

Queensland—Professor E. J. Goddard, D.Sc., Department of Biology, University of Brisbane; Mr. C. T. White, F.L.S., Government Botanist.

South Australia—Professor T. G. B. Osborn, D.Sc., Department of Botany, University of Adelaide; Mr. J. M. Black, Hon. Secy. of Committee.

Western Australia—Mr. W. M. Carne, Government Botanist.

Tasmania—Mr. L. Rodway, C.M.G., Government Botanist; Mr. R. A. Black, Botanist of Agricultural Department.

It was determined, either unanimously or by a large majority, that the Ithaca Congress be asked to place on the list of *nomina conservanda* the following generic names:— *Muehlenbeckia*, Meisn., *Denhamia*, Meisn., *Oreomyrrhis*, Endl., *Leucopogon*, R. Br., *Angianthus*, Wendl., and *Olearia*, Moench, and to place on the list of *nomina rejicienda* the names, *Calacinum*, Rafin., *Karkinetron*, Rafin., *Sarcogonum*, G. Don, *Leucocarpum*, A. Rich., *Caldasia*, Lag., *Perojoa*, Cav., *Siloxerus*, Labill., and *Shawia*, Forst. et f.

A vote was also taken on certain other plant-names regarding the use of which there has been a divergency of opinion among Australian botanists. The result, in most cases by a large majority, was in favor of retaining the following names, which have the right of priority in date of publication:—*Themeda*, Forsk. (1775) as against *Anthisteria*, L.f. (1779); *Stemona*, Lour. (1790) as against *Roxburghia*, Banks (1795); *Lomandra*, Labill. (1804) as against *Xerotes*, R.Br. (1810); *Lindernia*, All. (1762-65) as against *Vandellia*, L. (1767).

It was also decided to oppose any attempt which might be made to displace *Bassia*, Allioni (1766) in favor of *Bassia*, Koenig (1771).

J.M.B.

SHELL COLLECTING AT MIDDLETON

Middleton Beach has been well explored by the Conchologist. This quiet little village, situated on the shores of Encounter Bay, has long been noted for the profusion of shelly treasures which are being continually cast up on its shores. Being fully exposed to the ocean swell from the south, which breaks in serried ranks on rock and beach, most shells washed up, necessarily, are well beach-rolled and broken. If fortunate enough to be there on a low tide day many living specimens may be taken from under the loose flat stones, and on the barnacle-clad rocks. To the eastward shallow water runs far out, and on the beach—which extends in a long curve to Kingston—myriads of bivalves make their home. *Donax deltoides* (Lamarck)—much favoured by anglers for bait—is in countless numbers. They apparently live in restricted patches, following the tide in and out, and are easily found just under the surface of the sand covered by the tide wash. The beautiful pink bivalve—*Tellina albinella* (Lamarck), which, by the way, is rarely white; the rayed *Chione paucilamellata* (Dunker), and *Mactra rufescens* (Lamarck), are also to be found. An examination was made one early morning of a stretch of beach (not exceeding 25 yards in length), between Middleton and Goolwa. On this patch six distinct *Scaphellae* (Voluta) were obtained. South Australia is credited with ten Scaphellae, and to find representatives of more than half in one spot, certainly indicates the richness of Encounter Bay in this genus. The specimens taken were mostly well beach-rolled or broken in some way or other. The familiar *S. undulata* (Lamarck) was plentiful, and probably fifty were obtained of various sizes and condition. When in good order this shell is very

handsome. The dark brown undulating lines, flowing regularly over a creamy-white ground, with its orange tinted interior, and perfect glaze over all, places it in no mean position among the *Scapha*. Six young speciments of *S. fulgetrum*, and one large broken adult shell were found. The colour scheme of this shell is very fine. The name "*Fulgetrum*" meaning "sheet-lightning" aptly describes the bold, flame-like, chestnut and violet marking of the typical variety. *S. fulgetrum* has been divided into nine varieties, one of which (*S. tricincta*) has broad, even colour bands encircling the whorls. *S. fulgetrum* has been taken at Port Lincoln measuring eight inches in length. *S. guntheri* (Var. *adcocki*) was a rare find. This is considered a prize, and perfect specimens are valuable. Comparatively small ($1\frac{1}{4}$ inches) it is of distinctive shape, and easily identified. Thin brown, undulating markings follow one another evenly over the whorls, being intersected by two narrow bands of the same colour. This shell is a slight variant of the original *S. guntheri* (E. A. Smith) and was named by the late Professor Tate in 1888 after the discoverer, the late Mr. Adcock. Four specimens of *S. kreuslerae* (Angas) were taken; three being in fair condition, but colourless, and one much damaged, but still retaining some of the original deep orange decoration. This shell, which is elongated, measures up to three inches. Two adult specimens of *S. exoptanda* (Sowerby) were collected, both slightly broken and worn, but showing the lovely mottled chestnut markings. The name "*Exoptanda*" implies "to be desired," and anyone who has examined a perfect shell will thoroughly agree. The South Australian Museum representative is labelled as having been taken from a lobster pot at Port Victor. Four *S. papillosa* (Swainson) were collected, one fairly perfect. This is a finely painted shell—dark brown blotches of colour over a creamy-pink ground. The remaining *Scaphella* credited to South Australia are *S. verconis* (Tate) Gulf St. Vincent; *S. translucida* (Verco) Port Victor; *S. roadnightae* (McCoy) Southern Coast. Many other shells were found. *Mitra glabra*, *M. australis* and *M. rosettae*; *Polinices incei* and *P. conica*; *Tritons* (Cymatium) were represented by *C. waterhousei*, *C. subdistortum*, *C. quoyi*; *C. ancellaria* by *C. undulata* and *C. spirata*, and numerous other varieties of Mollusca. Middleton presents a fruitful field to anyone commencing a shell collection, and systematic search usually reveals much of interest, and many a treasure dear to the heart of the Conchologist.

F. TRIGG, Royston Park.

"The Australian Naturalist" for April, containing a list of Orchids found in Bulledallah, a most productive area of N.S.W., just N. of Newcastle.

"The Victorian Naturalist" for May.

"The Australian Museum Magazine," Vol. II, No. 6. The principal article is a well written and fully illustrated account of the Birth and Growth of an Oyster. Several other interesting articles are included in this fine number.

University School of Forestry.

Press notices give us the news that Mr. H. H. Corbin, B.Sc., of the Adelaide University School of Foresty and well known to our members as the director of the Kuitpo Forest, has been appointed as Professor of Forestry at the Auckland University, New Zealand. We heartily congratulate Professor Corbin on his appointment, but regret the loss to this State involved in his removal and the possible closing of the School of Forestry he carried on so enthusiastically at the University of Adelaide. The Federal Government has decided to establish a Federal School of Forestry in the Federal Territory at Canberra, and has allocated £12,000 for this year's expenses in connection with its establishment.

Our Flower Show this year is to be held on October 16 and 17. Members are asked to get into touch with any persons they may know who could send suitable specimens.

EVENING LECTURES.

Lectures: "Nature Books and Our Library." March 17, 1925.

Mr. B. B. Beck spoke on some of the celebrated Nature books of the past and present, more particularly with those dealing with fish and sea-life generally. He made special reference to the work of Dr. Leach on Australian Nature Study.

Mr. Ham spoke on the great work of the late D. E. Hutchins, "A Discussion of Australian Forestry," in which this most efficiently trained forester deals with Australian forestry problems.

The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia.

Adelaide | August, 1925

VOL. VI. | No. 4.

CONTENTS.

The authors of papers are responsible for the facts recorded and opinions expressed.

Address of the Section: C/o Royal Society's Rooms, Institute Building, North Terrace, Adelaide.

Published Quarterly **Single Copy—NINEPENCE**

Obtainable from Cole's Book Arcade, No. 14 Rundle Street, Adelaide.

Felstead & Omsby, Printers, Gilbert Place, Adelaide. 'Phone C. 1531

Field Naturalists' Section of the Royal Society of South Australia.

Office Bearers, 1924-25.

Chairman—Mr. E. S. Hughes.

Vice-Chairmen—Prof. T. Harvey Johnston, D.Sc., Mr. F. J. Bailey.

Hon. Secretary—Mr. E. H. Ising, Loco. Dept., Railway Station, Adelaide.

Assistant Hon. Secretary and Assistant Treasurer—Miss E. Ireland.

Hon. Treasurer—Mr. B. B. Beck, Cole's Book Arcade, Rundle Street.

Hon. Librarian—Miss I. Roberts.

Hon. Press Correspondent—Mr. D. J. McNamara.

Hon. Magazine Secretary—Miss M. Roeger.

Committee—Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Messrs. J. F. Bailey, Wm. Ham, F.R.E.S., W. H. Selway, W. J. Kimber, W. Champion Hackett, F.R.H.S., C. Pearce, A. J. Morison and J. A. Hogan, Miss Roeger, and the Chairman and Secretary of the Flora and Fauna Committee.

Hon. Auditors—Messrs. W. D. Reed, F.C.P.A., and A. J. Morison.

Fauna and Flora Protection Committee—Captain S. A. White, C.M.B.O.U., Dr. C. Fenner, F.G.S., Prof. J. B. Cleland, M.D., Prof. F. Wood Jones, D.Sc., Messrs. E. Ashby, F.L.S., M.B.O.U., W. H. Selway, J. M. Black, J. F. Bailey, A. H. Elston, F.E.S., A. M. Lea, F.E.S., F. Angel, W. Champion Hackett, F.R.H.S., B. B. Beck, J. Neil McGilp, A. J. Morison, and J. Sutton, and Mrs. W. Champion Hackett.

"The South Australian Naturalist," Editor—Mr. Wm. Ham, F.R.E.S., The University, Adelaide.

Business Committee—Miss Roeger, Mrs. Day, and Mr. J. Sutton.

FORTHOMING EXCURSIONS.

Aug. 15. Slape's Gully. Botany and Bird-life. Leader, Mr. J. A. Hogan. Burnside tram, 2 p.m.

Aug. 29 Semaphore. Shore-life and Conchology. Leaders, Mr. W. J. Kimber, Mr. F. Trigg. Train 2.5 p.m.

Sept. 5. Visit to Sir William Sowden's, Glen Osmond. Tram 2 p.m. Members only.

Sept. 12. Blackwood. Bird-life, native plants etc. Leader, Mr. Ashby, F.L.S., M.B.O.U. Tram at 2.3 p.m.

Sept. 26. Belair, National. Insect life. Leader, Mr. A. M. Lea. Train at 2.3 p.m.

Oct. 10. Mt. Lofty, Walking Tour to observe native plants, etc. Leader, Mr. J. A. Hogan. Train at 2.3 p.m.

Oct. 14 Mt. Compass. Botany. Leader, Professor T. G. B. Osborn. Charabanc 8 a.m. Book at least five days before with Mr. Beck.

Oct. 16 and 17. Flower Show in Town Hall. All members are invited to assist.

Oct. 24. Mt. Lofty. Geology and Physiography. Leader, Dr. C. Fenner, F.G.S.

Oct. 31. Fulham. Orchids and Birds. Leader, Captain S. A. White.

THE

South Australian Naturalist.

VOL. VI. ADELAIDE, AUGUST, 1925. No. 4.

OUR SHOW.

The Show of Native Flowers and National History Specimens of all kinds will be held this year on October 16 and 17, in the Town Hall, the use of which has been kindly granted us through the extreme kindness of the Lord Mayor, to whom we are very greatly indebted. In addition the Lord Mayor has kindly consented to declare the Show open.

Every member of the Section is earnestly invited to attend on Thursday evening and whenever convenient at any time between 9 a.m. and 11 p.m. on the Friday and Saturday. There is always a great amount of work to be done. Everyone is invited to help. Members who may have natural history specimens are invited to bring them along and so make the exhibition of greater interest.

SHELL COLLECTORS' CLUB.

Between 20 and 30 members of the Section have availed themselves of the offer of Mr. H. J. Kimber to form a Club to pursue the study of shells. The inaugural meeting held on Monday, June 22nd, decided to call the branch "The Shell Collectors' Club," At this meeting Mr. Kimber gave an instructive address on the nomenclature and structure of bivalve shells with some details of the habits of life of the animals who made them. A subsequent ramble along the beach on Saturday, July 25th., under the leadership of Mr. Kimber, gave the members plenty of material for addresses by the leader, and named specimens for collections.

Meetings of the Club will be held at the Royal Society's rooms on the first and third Mondays of each month. Members of the F.N.S. are welcomed.

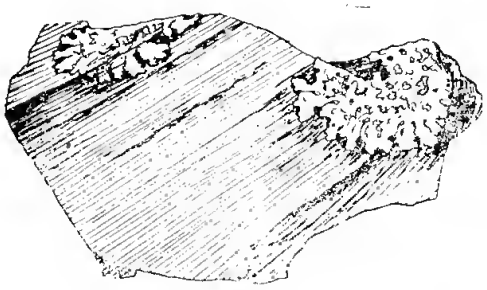
Mr. W. J. Kimber is Chairman of the Club and Mr. F. Trigg of Royston Park, Hon. Secretary. So far the Club has studied the following shells:

Solemya australis, Lamarck. Notable for the remarkable periostracum development.
Leda crassa, Hinds.
Arca trapezia, Destrayes.
Glycimeris radians, Lamarck.
Pinna inermis, Tate and P. tasmanica, Ten. Woods.
Malleus albus, Lamarck, The hammer-headed oyster.
Ostrea virescens, Sowerby. The Port Lincoln oyster.
Neotrigonia margaritacea, Lamarck, and varieties, *N. dubia, Sowerby* and *N. bednalli, Verco.*
This bivalve, known only in fossil form in other parts of the world, is found living in certain Australian waters. Notable for its complicated hinge system, and the beautiful iridescent interior.
Pecten medius, Lamarck, The scallop shell.
Chamys asperimus, Lamarck.

LICHENS.

By Ellen D. Macklin, B.Sc.

There are many aspects of Lichenology, but perhaps ecological and biological points prove to be most interesting from a general standpoint. Few groups of plants are more important in ecological work than are the lichens. No survey of any district can be really complete until its lichen flora has been investigated. They are the pioneers in colonisation of many bare rock and soil surfaces, and occur everywhere on the outskirts of the plant world. Even on a single rock one may see all stages in colonisation by plant life: the drier exposed parts with their local patches of crustaceous licens; the moister rougher sides covered with fruticulous and foliaceous forms, frequently intermingled with mosses; and finally the stage where small flowering plants and others, which inhabit mere fertile parts, occur.

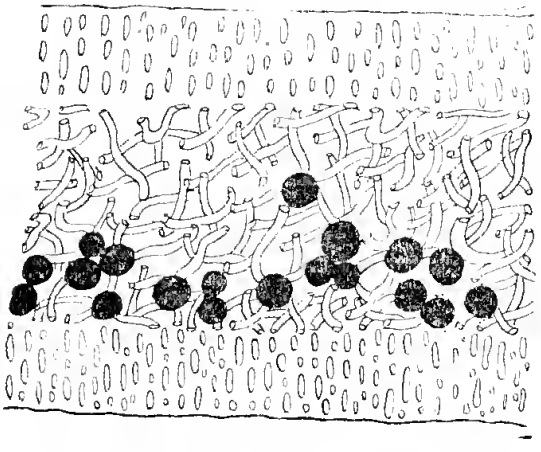


A Foliaceous Lichen on Stone.

There is no habitat, provided growth is possible, that is too hot, too cold or too dry for lichens to grow. They stretch from pole to pole, inhabiting desert and mountain tops alike. Lichens

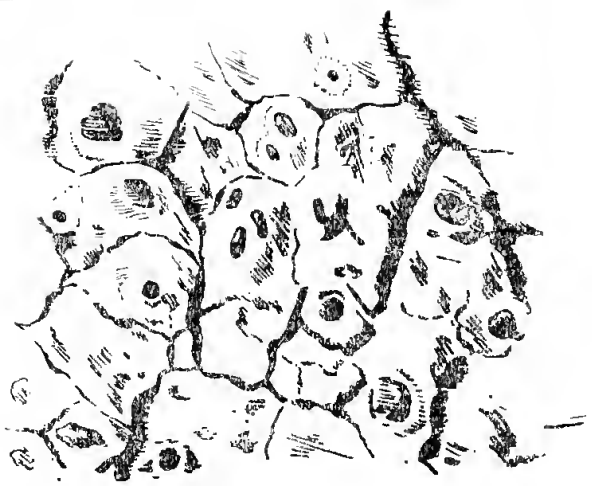
occur in the Antarctic, where no other growth, except perhaps a few algae, is seen; they fade out only as they reach the permanent covering of ice and snow. Even in the heat of the desert they grow. The hot dry sands of African and Asiatic deserts show peculiar forms. For the most part these species are not rooted but blow about in the drying winds, quite parched and dry. Their existence in such places is due to their power of rapid water absorption, and also to their power of entering into a resting stage with no apparent preparation. While water is present, growth and reproduction proceed hurriedly but when the supply is exhausted they roll up and become dormant. Generally speaking the best localities for the luxuriant growth of lichens are where plenty of light and fresh air, and accasionally some fresh water are present. Perhaps their demand for fresh-water explains their absence from towns; it is well known that smoke fumes are toxic to them.

The lichen is not a simple organism, its thallus, that it, its vegetative body, is compound, being composed of two distinct types of organism; a fungus and an alga, living in intimate connection. The fungus forms the main part of the thallus, the algal cells being enclosed in the middle portion by the fungal hyphae. The green algal cells are called Gonidia. The species of algae which provide the gonidia are simple organisms requiring, normally, a great deal of light and moisture. The fungus, on the other hand prefers darkness, but still demands much moisture. When they enter into partnership they break with all their old ways of life, and ask only for light and fresh air with an occasional water supply.



Transverse Section of Lichen Thallus.

Many interesting views have been advanced concerning the relationships between the fungus and the alga of the lichen thallus. At one time it was thought that parasitism might explain it, the fungus being assumed to prey upon the alga, but the long healthy life of both organisms does not suggest parasitism, which is always more or less fatal to the parasitized host. Later the connection was thought to be one of symbiosis, where mutual growth and inter-dependence come into play. Some investigators held that the fungus derived nutriment from the algal cells as they died; but this hardly allows for the normal wastage of all organic beings, and the presence of a few dead algal cells in the thallus as a whole. Perhaps no more fantastic view has been advanced than that the connection is one of Helotism (Greek Heilotes, a slave). It was thought that the fungus was the master and the alga the slave. The fungus certainly predominates in the union, but it is now thought that each component provides something that the other cannot supply or exist without, so that there is a mutual benefit in this strange association.



A Crustaceous Lichen showing "Chinking."

The many species of lichens fall naturally into three growth types, namely crustaceous, foliaceous and fruticulous. The crustaceous forms are the simpler and grow closely applied to their substratum, so that they reproduce fairly accurately the contour of the surface upon which they grow. The upper surface of the thallus of these forms frequently show division into many-sided portions, separated by deps chinks. These have the appearance of cracks, but they are more than that because they are part of the lichen organisation. This chinking has a physiological significance; in Summer the many-sided areas are widely separated, but on the application of water, the chinks close up, very little of the water falling on them is lost, and while it lasts the lichen

grows and feeds. If the thallus were not chinked in this way the lihcen would be seriously injured during weather changes, by cracking.

Fruticulous and foliaceous forms of lichens appear to be more advanced than crustaceous ones. They grow on more fertile surfaces, and possibly these better conditions have produced the more highly differentiated type of thallus. These species grow attached to their substratum by means of small root-like structures sent out from their lower surface. This surface in higher forms is the absorptive region, because the upper surface, being so exposed, is protected by a waxy covering to prevent excessive water loss.

Lichenology is a very wide subject, and at present in Australia is not an easy subject for investigation. There are so-many species that the mere use of generic names is misleading. Moreover a study of lichen forms divorced from their habitat is greatly to be deprecated, so that the lichenologist must also be an ecologist if valuable work is to be done.

Lichens which live inside rocks are of special interest. One species makes its way into limestone rocks. The great importance of these forms is obvious. They initiate the breaking down of rocks. The lichen makes its way into the rock, and nothing but the small reproductive cups reach the surface of the rock. These cup-like hollows left by the apothecia soon enlarge under atmospheric influences. Moss spores may germinate in them and also higher forms of lichen growth. Organic matter accumulates in these hollows, preparing the soil for larger plants. From this it will be seen that the pioneering work of crustaceous lichens is of great importance in the making of a plant habitation from bare surfaces.

AN ARBORETUM FOR ADELAIDE.

Adelaide, with its genial climate, can grow the trees of the temperate and warm temperate regions, as well as many of tropic growth.

Thanks to the energy of Mr. A. W. Pelzer, the City gardener, a great many varieties are already growing in our streets, parks, and municipal gardens. Through the kindness of Mr. A. Morison we are able to give a list of the trees planted along the War Memorial Drive, between the Adelaide Bridge and Frome Bridge. They comprise the following species :

English Ash tree (*Fraxinus excelsior*)
False Acacia (*Robinia pseud-acacia*)
Scotch Elm (*Ulmus Montana Dover*)

Wattle (*Acacia longifolia*)
Wattle (*Acacia linifolia*)
Wattle (*Acacia saligna*)
Wattle (*Acacia pycnantha*)
English Oak (*Quercus Robur*)
Yate Gum (*Eucalyptus cornuta*)
Lemon-scented Gum (*Eucalyptus citriodora*)
Tooart Gum (*Eucalyptus gomphocephala*)
Aleppo Pine (*Pinus halepensis*)
Canary Island Pine (*Pinus canariensis*)
Norfolk Island Pine (*Araucaria excelsa*)
Bunya-Bunya Pine (*Araucaria Bidwillii*)
Kauri Pine (*Damara Australis*)
Maidenhair Tree (*Salisburia adiantifolia, or Ginkgo biloba*)
Pyramidal Oak (*Quercus pedunculata fastigiata*)
Round-headed Acacia (*Robinia p. var. incrinis*)
White Poplar (*Populus alba*)
Hawthorn (*Cretaegus oxyacantha*)
Silky Oak (*Grevillea robusta*)
Camphor Tree (*Camphora officinalis*)
White Cedar Tree (*Melia Azedarach*)
Tamarisk (*Tamarix gallica*)
Hickory (*Carya tomentosa*)
Pecan Nut (*Carya olivaeformis*)
Tree of Heaven (*Ailanthus glandulosa*)
Torch Tree (*Dais cotinifolia*)

Additional species have been planted in the other sections of the Drive.

ADDITIONS TO THE LIBRARY

1. Dr. A. W. Hill has kindly presented the Library with a set of ten numbers of the "Australian Museum Magazine."

2. "The Romance of the Fungus World" contains a most interesting account of Mushrooms, Toad-stools and their allies. The volume is well illustrated and is written in popular language.

3. "Save Australia. A Plea for the Right Use of our Flora and Fauna."

This is an extremely important work on the Fauna and Flora of Australia, compiled by various writers who are authorities in their particular sections of the volume.

Captain White contributes a chapter on "The Movement for bird Protection in South Australia."

4. "A Naturalist's Holiday by the Sea." By Arthur de Carle Sowerby, F.R.G.S., F.Z.S., M.B.O.U.

This book is written on the shore-life of the coast of Cornwall, but much of the book will be found of intense interest to students of the flora and fauna of our own beaches.

EVENING LECTURE, by Dr. PULLEINE

On "Tasmanian Holidays," May 19, 1925.

Dr. Pulleine in his characteristic breezy style gave a short account of his very successful journeys in the North-West of Tasmania in search of the remains of the aborigines of that island. By means of pictures, and specimens he illustrated kitchen-middens and various relics of this vanished race.

The finding of the remains of rude "houses" was an important advance in our knowledge of these backward people.

EVENING LECTURES, JULY 21, 1925.

Miss Macklin, B.Sc., gave a most interesting lecture on *Lichens,* part of the lecture being reproduced in this issue.

Mr. E. H. Ising gave a short account of a "Holiday at Beachport," dealing with the natural history of the place.

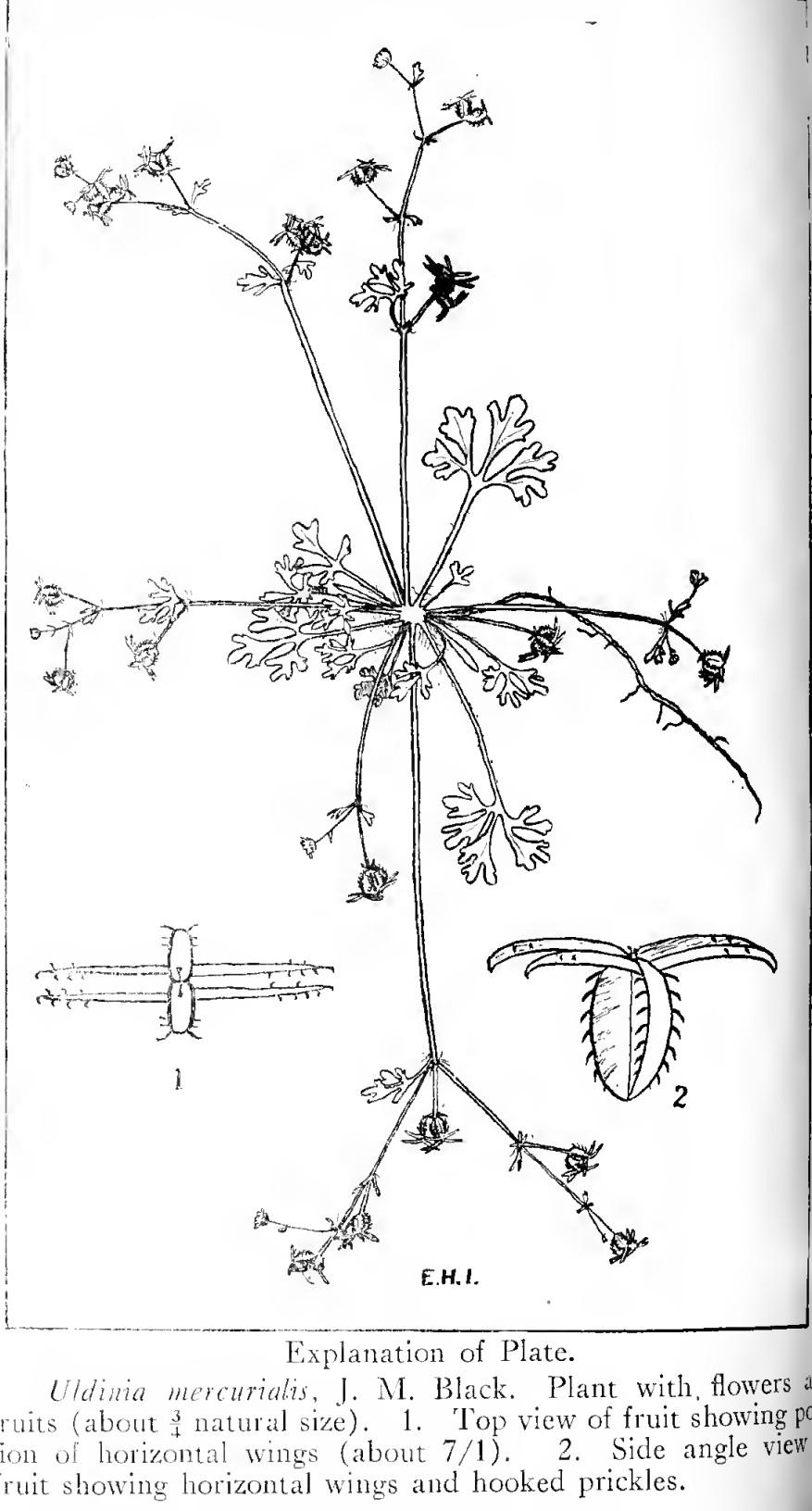
EVENING LECTURE by Mr. A. M. LEA.

"Travels in the Pacific." May 19, 1925.

Mr Lea explained that he had been selected by the Fijian Government to make an investigation into the occurence and and life history of a small moth (*Levuana iridescens*) which in infesting the coconut trees and doing so much damage that they become weakened and occasionally die. So great is the damage done by the pest that the principal industry of the islands, the preparation of Copra from the Cocoanuts, is threatened with absolute destruction. The moth is probably not indigenous but has been accidentally introduced. Mr. Lea searched for its parasite, visiting the islands of Torres Straits, Java etc.

In Java he was successful in finding and collecting a parasite of a closely allied moth (*Brachatona Catorantha*) of which he obtained large numbers. Unfortunately they died before reaching Fiji on the return journey. The parasite proved to be so short lived that it was found impossible to land it safely in Fiji. Mr. Lea's opinion is that an aeroplane flight is the only method of placing the parasite in Fiji. Considering the importance of the industry to Fiji this should be possible of arrangement.

The lecturer related many incidents of his travels in the various islands and the lecture was one of great interest and scientific value. It is to be hoped that Mr. Lea's work will result in as great benefit as did the former research when his investigation of the life history of the wheat weevil and means for its destruction were the direct causes of saving millions to Australia..



Explanation of Plate.

Uldinia mercurialis, J. M. Black. Plant with flowers and fruits (about $\frac{3}{4}$ natural size). 1. Top view of fruit showing position of horizontal wings (about 7/1). 2. Side angle view of fruit showing horizontal wings and hooked prickles.

A RARE SOUTH AUSTRALIAN PLANT.

By Ernest H. Ising.

Uldinia mercurialis, J. M. Black. This new plant was found by me at Ooldea in September, 1920, and was described by Mr. Black in the Transactions of the Royal Society of S.A. (1), with a drawing (2). It is not only a new species, but a new genus had to be created in Umbelliferae for its reception. The plant is prostrate in habit and its stems spread flat on the ground, measuring about 12 inches across. The leaves are radical and deeply cut into 3 segments, which are lobed again. The flowers are very small and deep blue in colour forming simple umbels. The fruits are the most remarkable part of the plant, being distinguished from other Umbellifers by the possession of wings to the mericarps. There are four horizontal rigid hooked wings, situated at the top on either side of the mericarps, which also have two rows of hooked prickles on the outside edge.

The plant was only found in one small area of flat, sandy soil and was associated with *Eremophila alternifolia, Acacia Kempeana,* etc.

The name "Uldinia" is derived from the native name of Ooldea Soak, which has a wonderful supply of fresh water, which is drawn upon for the supply of the East-West Railway. The specific name was given in allusion to the fanciful resemblance of the appendages of the mericarps to the winged feet of Mercury.

(1) Vol. XLVI., (1922), 568.
(2) Plate XXXVII, 2.

A KINDRED SOCIETY.

Some members of the W.E.A. (Workers Educational Association) classes at the University have formed a Ramblers' Club. The initial outing was held on Saturday, August 16th., when a large party took train for Hallett's Cove Station and walked to the Cove. A halt was made at the famous glacial rock (originally discovered by Mr. Stirling Smeaton but first described by Professor Howchin). The leader for the afternoon, Mr. Ham, of the F.N.S., described the Permo-Carboniferous glaciation of South Australia and made reference to the many interesting geological and physiographical features of the coast. A hearty invitation was given to members to join in our own excursions.

DEATH OF Mrs. W. CHAMPION HACKETT.

The death of Mrs. W. Champion Hackett removes a member of the Society who was greatly liked by all who came into contact with her. The deceased lady was a good worker for the Society, especially in connection with the Annual Show.

A SUBURBAN WALK.

On a recent Saturday afternoon a small party of members rambled through a little-known part of the suburbs and saw some very novel sights.

For one thing, during a walk of over three miles we were never out of sight of golden oranges shining out against a lovely background of deep green, often bordered with rows of the beautiful delicate pink blossoms of almond trees in full rich bloom.

What a wonderful show they make in July and August!

Only rarely a feathery wattle raised its pyramid of yellow glory amongst the exotic evergreen beauty of the citrus trees.

It was an unfrequented track we took. Our much-travelled lady member chose it for us. Not once on our three-mile route did we see (or even hear) a bus!

Yet we were not more than four miles out.

Our guide led us along a narrow lane crossing a purling brook (not creek, please), bordered with orange trees and almonds.

Here we saw several of the ancient habitations of S.A., with slate roofs, little windows made up of tiny panes set at all impossible levels, and with the dearest old trees and old fashioned gardens.

Yet even in this Eden the snake has of late intruded. Here he takes the form of the builder, who has begun operations by ruthlessly cutting down and grubbing up and sawing into sections (preparatory to splitting into vulgar fence posts) the beautiful-coloured gums of a goodly part of the old estate. Hurrying past the scene of destruction, we come to the really extraordinary part of our tour. Here, we could hardly persuade ourselves that we were in Adelaide, the prim, and straight, with streets so rectangularly set. Not only was the lane crooked but it was actually curved, so that one could not see far ahead, or to the rear.

Appropriately enough it is known as, "Lovers' Lane." Even the two bachelors of the party were impressed and after we had crossed and duly admired the bridge at Felixstowe one of the two volunteered to show us some more green lanes, which he seemed to think would hold their own against our "Lovers' Lane." And to our amazement, so it came to pass. Behold then, the narrow lane, with green gardens on either side, and the party striding on agog with excitement, when suddenly a bovine quadruped is heard rushing on, with a horseman in full pursuit. Some members seek safety through the fence, while others bravely repel the invader of our sylvan sanctity. When peace is restored, our valiant guide takes us boldly through a private garden (nothing eatable handy, be it noted), and then to an almost forgotten break in a thick hedge, which we found open, but closely-guarded, first by a wheel-barrow and secondly by a big black dog, who eyed us suspiciously, but evidently is able to distinguish that we

are harmless bug-hunters.

Still more orange orchards, glowing green against the beautiful back-ground of hills and clouds. A short side lane gives us a view overlooking the river, and the trip finishes at one of the ancient landmarks of Adelaide, the cellars, now disused, of the original Walkerville Brewery.

EXCURSION TO KINCHINA, JUNE 8, 1925.

A small party visited Kinchina on June 8th, under the leadership of Mr. J. Sutton.

Following is a list of birds noted by the leader during the day:—

Bronzewing Pigeon, Banded Plover, Whistling Eagle, Australian Goshawk, Purple Crowned Lorikeet, Crimson Rosella, Red-backed Parrot, Narrow-billed Bronze Cuckoo, Welcome Swallow, Jacky Winter, Red-capped Robin, Hooded Robin, Grey Fantail, Willie Wagtail, Crested Bell Bird, Rufous Whistler, Grey Strike Thrush, Southern Scrub Robin, White-browed Babbler, Little Thornbill, Red-tailed Thornbill, Chestnut-tailed Thornbill, Yellow-tailed Thornbill, Southern Weebill, Magpie Lark, Whiteface, Yellow-tailed Pardalote, White-naped Honeyeater, Striped Honeyeater, Tawny-crowned Honeyeater, Singing Honeyeater, White-eared Honeyeater, Yellow-plumed Honeyeater, White-plumed Honeyeater, Yellow-winged Honeyeater, Red Wattle Bird, Spiny-cheeked Honeyeater, Diamond Firetail, Crow, Black-winged Bell Magpie, Butcher Bird, White-backed Magpie. Total, 42 species, 294 individuals.

VISIT TO THE BOTANIC GARDEN, JUNE 20, 1925.

A large party of members were shown round by the Director, Mr. J. F. Bailey, who gave a most interesting account of some of the many varieties of trees in the Garden.

The Kauri Gum of Queensland is well represented but the N.Z. variety is not known to be growing in any of the Botanic Gardens of Australia. The pink gum (*Eucalyptus Calophylla*) and the *Melaleucas* were greatly admired. Specimens of the Hoop Pine (*Araucaria Cunninghami*) do well as does *A.Cookii* and the "Bunya Bunya" pine (*A. Bidwillii*)

The Garden is now able to show a fine variety of *Acacias*, which in their new situations show very healthy growth.

The party were greatly interested in the efforts of Mr. Bailey to grow specimens of our native flowers, the ground round the old Palm House being devoted to these. Mr. Bailey is also growing many of our native plants in pots with very great success. An inspection of these "wild" plants under cultivation brought a most interesting visit to a close.

VISIT TO DR. HILL'S AT FULLARTON, JULY 4, 1925.

A party of 30 members visited the residence of Dr. A. W. Hill at Fullarton where they were most hospitably entertained by Dr. and Mrs. Hill. The doctor gave a most interesting account of a trip to New Guinea and the adjacent islands. Entertaining, witty and informative as his remarks were, they were in addition supplemented by the use of a splendid collection of natural history specimens collected on the trip. Questions were encouraged and the doctor was able to give an intimate account of the life of the natives from the point of view of a medical man.

After the kind hospitality of the host and hostess had been partaken of, an adjournment was made to the doctor's museum containing scores of walking sticks of various woods and other materials, the carving, turning, varnishing, etc., being a hobby of Dr. Hill's.

VISIT TO THE MUSEUM, JULY 18, 1925.

Members were received by the Director, Mr. Edgar R. Waite. The attention of the party was directed to a new exhibit in the shape of a number of "trying-out" pots, which had been used in conection with the whaling carried on along our coasts in the early days of the colony, at Kangaroo Island, Encounter Bay, and the far West Coast. A curious old whaling gun presented by the Pumbelows of Encounter Bay, was also on view.

A large logger-head turtle, the only one caught in these waters, was on view, and Mr. Waite gave the party an informative address on the differences between "turtles" and "tortoises."

Mr. A. M. Lea then showed the party a selected number of interesting and unusual insects.

EXCURSION TO MORIALTA, MAY 23, 1925.

Notwithstanding the very unpropitious weather a party visited the Reserve under the leadership of Professor J. B. Cleland. Several species of fungi were found and commented on by the leader. *Acacia podalyrifolia* was observed in full bloom and *A. Baileyana* just bursting into flower. Many beautifully symmetrical trees of sheoak show how finely these trees grow when on suitable soils.

OUR EXCHANGES

1. "The S.A. Ornithologist" for July, 1925.
"A Trip to the Coorong" by J. Sutton, is an interesting feature.
2. Smithsonian Reports:
(a). "How Deep is the Ocean ?"
(b). "Two Decades of Genetic Progress."
(c). "Observations on a Montana Beaver Canal."
(d). "The Republic of Salvador."
(e). "The Tent Caterpillar."
(f). "The Archeology Collections in the U.S. National Museum."
(g). "Some Aspects of the Use of the Annual Rings of Trees in Climatic Study."
(h). "The Age of the Earth."
(i) "Fogs and Clouds."
(j) "Proceedings of the Academy of National Sciences,
3. "Proceedings of the Academy of National Science, Philadelphia, U.S.A."
4 "The Australian Museum Magazine" for July, 1925. " The Cultivation of the Oyster" is one of the excellent articles.
5 A number of phamphlets (in Polish and English) from the Polish National Museum of Warsaw.
6 "Journal o. the Arnold Arboretum of Haward University." October, 1924 and April, 1925.
7. "The Victorian Naturalist," June, July, August numbers.
8. "The Australian Naturalist" (N.S.W.), April, 1925.
"Watson Microscopic Record," No. 4., Jan., 1925.
The current number, received from Messrs. W. Watson & Sons, of Evans' Buildings, James Place, Adelaide, contains material of interest to all microscopists, an article on "The Microscope and Pond Life" should prove of use to members taking an interest in pond life.